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BRITISH MEDICAL JOURNAL

LONDON SATURDAY OCTOBER 21 1944

PLASMA VOLUME IN TRAUMATIC SHOCK

BY

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The estimation of plasma volume in patients with traumatic shock has been beset with difficulties. Most methods have depended upon the estimation of Evans's blue in plasma after the injection of a known quantity of the dye into the blood stream. In fasting subjects quite reliable results can be obtained by direct determination of the dye in plasma, but the turbidity of the plasma of non-fasting subjects, and especially of patients with traumatic shock, renders this method very unreliable. The technique described by Crooke and Morris (1942) has overcome this difficulty, but it has been found that a small amount of haemolysis which cannot always be avoided in shocked patients has led to considerable errors in the estimation. A method of correction for this has now been devised (Morris, 1944), but a further serious cause of error has been traced to the effect of morphine or hyoscine given to patients before the injection of Evans's blue (Bowler, Crooke, and Morris, 1944). These substances may cause anomalous dye concentration curves, thus making the determination of plasma volume impossible. Normal curves are obtained, however, when the dye is injected a sufficient time before the morphine or hyoscine to allow it to become uniformly mixed in the circulation. In the light of these observations a number of determinations of plasma volume in shocked patients can now be regarded as valid, although many of the earlier cases have had to be discarded.

The haemoglobin (pyridine-haemochromogen method, Rimington, 1942) and haematocrit were measured repeatedly in some of the cases and were found to run parallel. The determination of haemoglobin is more accurate than that of the haematocrit, and the latter has been omitted in more recent cases. Total blood volume cannot, therefore, be determined, but it gives little more information than plasma volume when the haemoglobin value is also known. Only the values of plasma volume and of haemoglobin will, for this reason, be recorded in this paper.

A few typical cases are described briefly. Some of the patients were admitted to the London Hospital, while others were seen in outlying hospitals.

Clinical Material

Case 1.—A man aged about 50 was run over by a heavy lorry at 10.30 p.m. He was admitted at 11.10 p.m., conscious but restless, and protesting against interference. His skin was cold, clammy, and cyanosed, and his blood pressure was 98/72 mm. Hg. He was found to have a badly crushed pelvis. The gluteal muscles were partly torn off and the left testicle was hanging out of the torn scrotum. The extent of internal injuries could not be ascertained, but the rectum appeared to be intact. There was also a cut over the right eye and blood in the left ear. He vomited beer-smelling fluid material. At 11.45 p.m. a determination of plasma volume was started, and a value of 1.75 l., or about 2.1% of body weight (about 13 st.), was obtained. His haemoglobin was 14.1 g./100 c.cm. At 11.55 p.m. he was given morphine gr. 1/4, and at 12 a.m. a transfusion of plasma was begun. At 12.10 a.m. his blood pressure was found to be 58/38 mm. Hg and pulse rate 80. At 12.30 a.m. he was given morphine gr. 1/4, but he got steadily worse. At 1.10 a.m. his blood pressure had fallen to 43/30 mm. Hg and his haemoglobin to 11.9 g./100 c.cm. after a transfusion of about one bottle of plasma. He died at 2.15 a.m. He was found at necropsy to have extensive crushing injuries across the left groin and hip, with a 14-in.-long split from the groin through the perineum to the buttock. The left ilium was fractured, but no injury of internal organs was found.

Case 2.—A woman aged 36 was kicked in the abdomen by a horse at 3 p.m. She was admitted to hospital at 5.30 p.m. complaining of severe abdominal pain. Unfortunately we did not see this patient alive, but she was said to be very shocked on admission. The pulse was very weak—the rate about 130. The blood pressure was about 60/30 mm. Hg. The abdominal wall was lax, especially in the left hypochondrium, where she was tender on palpation. No free fluid was detected in the abdomen and no other injury found. She was given morphine gr. 1/6 and atropine gr. 1/100 on admission, followed by morphine gr. 1/4 at 6.55 p.m. At 9.15 p.m. her blood pressure had risen to 100/50 mm. Hg, her pulse had fallen to 110, and her general condition was stated to have improved slightly. At 9.30 p.m. she was catheterized and almost pure blood was withdrawn. At 10.7 p.m. a determination of plasma volume was started; this gave a figure of 1.9 l., or about 3.3% of body weight (about 9 st.). The haemoglobin was 10 g./100 c.cm. At this time the blood pressure had fallen again to 80/30 mm. Hg, and the pulse to 90. She was given morphine gr. 1/4 at 10.40 p.m. She was said to have improved slightly during the night, but at 7.5 a.m. she died suddenly. A coroner's post-mortem examination was performed, and she was found to have a complete rupture of the left kidney with a large retroperitoneal haematoma of from one to two pints. There was a small rupture of the spleen, with fractures of the 8th, 9th, and 10th ribs near their costo-vertebral joints.

Case 3.—A woman aged 22 was admitted to hospital at 4.22 a.m. complaining of profuse vaginal bleeding, which began about midnight, but her history was unreliable. She was conscious but collapsed and very pale, with a pulse rate of 132 and a blood pressure of 95/45 mm. Hg. She had extensive vaginal lacerations, apparently inflicted manually, but there was only slight bleeding when admitted. She was not pregnant. At 4.55 a.m. her condition was unchanged and a determination of plasma volume was begun which gave a value of 2.74 l., or about 4.5% of body weight (9½ st.). The haemoglobin was 10 g./100 c.cm. The lacerations were subsequently sutured and she made an uninterrupted recovery.

Case 4.—A woman aged 55 was beaten on the head and arms by a man with an iron bar at 10.30 a.m. The police reported finding a great deal of blood about. On admission at 12.10 p.m. she was conscious but apathetic and very pale and cold. The pulse was 80, regular and of small volume. The blood pressure was 70/50 mm. Hg. She had multiple lacerations of the scalp, with little bleeding at this time, a fracture of the shaft of the lower third of the left ulna, and some cuts on the hands. A determination of plasma volume was started at 12.38 p.m., and a figure of 1.92 l. was obtained, or about 3.8% of body weight (about 8 st.). The haemoglobin was 13.8 g./100 c.cm. The blood pressure and pulse were unchanged. At 1.25 p.m. she was becoming restless, and was given omnopon gr. 1/3 and scopolamine gr. 1/150. At 1.55 p.m. a transfusion was started, and she was given two bottles of blood. Her condition then improved steadily, and her wounds were dressed and the fracture set at 8 p.m. Ultimately she was discharged well.

* Member of the Mobile Team of the Shock Committee of the Medical Research Council under Sir James Walton.

Case 5.—At 11.15 a.m. a man aged 54 fell 30 ft. from a building he was demolishing. He was semiconscious on admission to hospital at 12 p.m. and resisted attempts to examine him. His extremities were cold. His pulse rate was 156 and blood pressure 115/90 mm. Hg. There was a deep laceration of the right cheek, and cerebrospinal fluid was escaping from the left nostril. The pupils were equal, but the right reacted to light better than the left. Slight left facial weakness and slight spastic weakness of the left arm were present. The left plantar response was equivocal, but the right was flexor. There was swelling of the right wrist and the left ankle. Subsequent *x*-ray examination showed a fracture of the left malar bone running back into the anterior cranial fossa, involving the floor of the left orbit. There was also a fracture of the right radial styloid process and the left internal malleolus. The plasma volume, determined at 2.6 p.m., was 2.2 l., or 3.9% of body weight (about 8 st. 12 lb.). The haemoglobin was 13.4 g./100 c.cm. The blood pressure at this time had fallen to 115/80 mm. Hg and the pulse to 130. He was given morphine gr. 1/4 at 2.15 p.m. He gradually recovered consciousness during the next three days, but was found to have complete aphasia. He continued to improve, however, and the plasma volume was estimated again two weeks after admission. It was found to have risen to 3.1 l., or 5.5% of body weight. The haemoglobin had fallen to 9.5 g./100 c.cm.

Case 6.—A boy aged 14 fell in front of a bus and sustained a head injury at 5.10 p.m. He was admitted to hospital unconscious at 5.30 p.m. His skin was grey-coloured but warm and not sweating. His blood pressure was 156/110 mm. Hg and pulse rate 100. His pupils were deviated to the left, but otherwise there were no abnormal signs in the central nervous system. There was no evidence that he had lost any blood. At 6.30 p.m. he had recovered consciousness sufficiently to take sips of tea. The pupils were still deviated to the left. The blood pressure was 130/85 mm. Hg and pulse rate 96. A determination of plasma volume was started at 6.36 p.m., and was found to be 3.45 l., or 6.2% of body weight (8 st. 11 lb.). His haemoglobin was 11.6 g./100 c.cm. He continued to improve steadily, the deviation of the pupils disappeared, and he was finally discharged well.

Discussion

A reduction of plasma volume is accepted as being charaeteristic of traumatic shock, the amount of the fall being proportional to the severity of the shock. In general this has been confirmed in the present series of cases, but the reduction is greatest when examined early, as shown by the first two patients, both of whom died of their injuries. In Case 1 the plasma volume had fallen from the normal level of between 4.5 and 5.5% of body weight to about 2.1% in 1¼ hours. This patient died 3¼ hours after a severe crushing injury of the pelvis. In Case 2 the plasma volume was about 3.3% of body weight 7½ hours after the patient sustained a ruptured kidney and spleen. She died 16 hours after the injury. In less severe cases the reduction of plasma volume may be slight, especially if not examined until some hours after the injury. This is demonstrated by Case 3, in which the plasma volume was about 4.5% of body weight some five hours after traumatic vaginal haemorrhage, from which the patient made an uninterrupted recovery.

Head injuries may also be accompanied by a reduction of plasma volume, but only when haemorrhage has occurred. In Case 4 the plasma volume was about 3.8% of body weight some two hours after the patient received severe lacerating wounds of the scalp, cuts on the hands, and a fractured ulna. It was not known if she had temporarily lost consciousness. She made an uninterrupted recovery. In Case 5 the plasma volume was about 3.9% of body weight some three hours after the patient sustained a fractured skull with cerebral contusion, deep lacerations of the face, and minor injuries of the wrist and ankle. In both these patients there had been obvious haemorrhage associated with the head injuries. In contrast to them, no haemorrhage occurred in Case 6, a patient who received severe cerebral concussion which was associated with a transient hypertension. The plasma volume was about 6.2% of body weight about 1½ hours after the accident.

Haemoglobin concentration falls following traumatic shock, but the fall is minimal immediately after the injury, and may not become marked until several hours later. In Case 1, the most severe example, it was normal—14.1 g./100 c.cm. at the time of estimation of the plasma volume 1¼ hours after the accident. In Case 4 it was 13.8 g./100 c.cm. and in Case 5 13.4 g./100 c.cm. at the time of estimation of the plasma volume about two hours and three hours respectively after the patients were injured. In both Case 3 and Case 2 it was 10 g./100 c.cm. some 5 hours and 7½ hours respectively after the injury. This series shows a progressive fall in haemoglobin concentration as the time since the injury increases. The fall must be due to dilution of the blood with extravascular fluids, so that the determination of plasma volume at a later time may give a figure which is appreciably higher than would have been found one or two hours after the injury. Thus in Case 5 the haemoglobin was 13.4 g./100 c.cm. and the plasma volume 3.9% of body weight some three hours after the accident. Subsequently the haemoglobin fell to 9.5 g./100 c.cm. when a second determination of plasma volume showed that this had risen to normal—5.5%.

The reduction of plasma volume in all the cases which we have examined could be explained by haemorrhage alone, but many workers have claimed that shock is a toxic condition associated with haemoconcentration (see Moon, 1944). Haemoconcentration as judged by increased concentration of haemoglobin or a haematocrit value above normal has not been observed in any of the cases in our series except when associated with burns or with the crush syndrome (Bywaters, Crooke, and Morris, 1943). Haemoconcentration in these cases is due to loss of serum into the damaged tissues without a corresponding loss of corpuscles. The conception that haemoconcentration occurs in traumatic shock in man is probably due to the cyanosed, viscid character of the blood in severe cases. We have found, however, that in contrast to this increased viscosity of whole blood the viscosity of plasma is below normal. In one instance a man aged 70 sustained multiple injuries. He had a fractured spine, pelvis, ribs, humerus, tibia, and fibula, and a ruptured aorta and pericardium. A little blood was obtained for examination at the time when a transfusion was started some 45 minutes after the accident. It welled slowly from a vein in the leg when this was cut down upon. It was very cyanosed and viscid. The plasma viscosity was 1.62 at 20° C., which is significantly less than the normal—2.0 at 20° C.

Dr. E. R. Holliday kindly examined this plasma, and reported as follows: The plasma was examined in the Tiselius electrophoresis apparatus at *p*H 7.5 in 0.05 ionic diethyl barbiturate buffer at a dilution of 1 part of plasma to 3 parts of buffer. The migration diagram obtained by the Philpot modification of the "Schlieren" method was not entirely satisfactory. The ascending and descending diagrams showed considerable differences. The main abnormality of both diagrams is a deficiency in α component.

The increased viscosity of the blood with a decreased clotting time and a normal haemoglobin suggests a state of incipient clotting. The fibrinogen content of the plasma was, however, found to be normal by electrophoresis. The increased viscosity of the whole blood may therefore be due to an abnormal state of dispersion of the α component, since it is known that both α and β components readily form gels under certain abnormal conditions. This gel would be removed in the centrifugal separation of cells and plasma, and such plasma would have a decreased viscosity, a deficiency in α component, and a normal fibrinogen content. A further study of this problem is, however, necessary.

Summary

Difficulties in the estimation of plasma volume in shocked patients and the methods employed in overcoming them are described.

The plasma volume may be reduced to about 2% of body weight in the most severe cases.

The haemoglobin concentration is generally reduced, except in some cases of burn shock and crush syndrome.

The reduction in haemoglobin concentration does not run parallel to the reduction in plasma volume. It is least pronounced immediately after the injury, but subsequently progresses as water is restored to the circulation from surrounding tissues. It is most pronounced after the plasma volume has been restored to normal.

The theory that haemoconcentration occurs in shock is discussed.

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EUSTACHIAN OBSTRUCTION AND OTITIC BAROTRAUMA IN AIR-CREWS OF HEAVY BOMBERS

BY

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The following report is presented from the academically elementary but administratively important viewpoint of the unit medical officer because of the subject's interest and as a possible guidance to civilian practitioners in the medical administration of aerial transport in the post-war era. The paper is based on the personal observation of 66 cases during a recent 30-weeks period with a heavy bomber squadron of the Royal Air Force.

These two conditions present one of the greatest problems that beset the medical officer on a flying station. The former condition, Eustachian obstruction, is so mildly incapacitating on the ground, unless the obstruction be sufficiently severe to form a complete block, that it is difficult to imagine how much administrative trouble may result therefrom. The limitation of the flying duties of one man may mean the cancellation of a sortie by a complete air-crew. But the decision to let a man fly with established Eustachian obstruction may equally well result in otitic barotrauma—which is therefore a lesion directly attributable to Service conditions—quite apart from the man's discomfort and the inefficient performance of his duties. The following figures are eloquent. During the 30-weeks period under review 56 men suffering from Eustachian obstruction were passed as unfit for full flying duty for periods of 24 hours or more, with a total loss of 145 "man nights"—an average, therefore, of approximately 2.5 nights lost per man. But for otitic barotrauma the corresponding figures are 10 men removed for a total of 204 nights, which gives an average of 20.4 "man nights" lost.

The term "Eustachian obstruction" has been used to cover all those cases presenting a reduction in the patency of the Eustachian tubes, whether partial or absolute. Strictly, the term "Eustachian obstruction" should be confined to cases of absolute "block," but terminology here is not easy. "Eustachian catarrh" is convenient but not always pathologically accurate. The term "Eustachian tube insufficiency" has been suggested, but is cumbersome; and "insufficiency" belongs more happily to the endocrine system than to an anatomical structure. "Otitic barotrauma" is a more exact and accurate descriptive term, and refers to those cases presenting persistent abnormal drum appearances and hearing changes.

Anatomy and Physiology

Some basic facts are worthy of recall. The Eustachian tube runs downwards, forwards, and medially from the middle ear to the nasopharynx. There is a bony part derived from the skull and a cartilaginous portion which lies under the mucous membrane to produce an elevation, and the tube is narrowest at the junction of these two parts. It is lined with ciliated columnar epithelium continuous with the pharynx; in the lower end of the tube are some mucous glands, and around the orifice some adenoidal tissue is present. Medial to the tube is the levator palati muscle, and the tensor palati lies lateral thereto. The salpingopharyngeus muscle arises from the inferior side of the cartilaginous portion and, in company with the former two muscles, is inserted into the soft palate. Consequently when these three muscles contract in swallowing the lower part of the tube receives a pull outwards in three directions and so should normally open.

The tympanic membrane consists of two layers—an outer layer derived from the skin and an inner derived from the mucous membrane of the pharynx—with an intervening sandwich layer of fibrous tissue. The drum derives a nerve supply, among others, from the auriculo-temporal nerve, which also supplies the lining of the external auditory meatus, and this has an interesting practical application, as will be seen later. The drum normally appears slightly concave externally and the tubes are generally closed.

Pressure Changes

On ascent, as the atmospheric pressure falls, there is a progressive increase of pressure in the middle ear, which is eased spontaneously by the opening of the Eustachian tubes and the expulsion of a volume of air sufficient to equalize the pressure. This occurs without any discomfort, and all the subject notices is a succession of "clicks" in the ears. In none of these cases has there been any complaint of pain on the way up. On reaching and remaining at a constant altitude equilibrium between the internal and external pressure on the drum is maintained by the above mechanism. On descent the external pressure on the drum builds up, and to restore normality air must enter the middle ear. But the tubes open more readily to an increase of pressure from the aural end than to a similar increase at the pharyngeal opening, and this is where the difficulty starts.

Swallowing is the normal physiological way of opening the tubes, and is therefore the first manœuvre tried. Certain people achieve greater success by manipulating the mandible in an antero-posterior plane or by wide chewing movements. In difficulty, however, the most universally effective method is auto-inflation, by Valsalva's method, in which there are several important points. First, the cheeks should not be puffed out, as the extra pressure is taken up in the buccal cavity, whereas it is in the post-nasal passage that the increase is desired. Secondly, the pressure should be slowly built up, as the tubes open more comfortably to a slowly increasing pressure than to a sudden short burst. Lastly, it is helpful to incline the head forward with the chin on the chest.

A greater change of pressure takes place between 10,000 feet and ground level than between 20,000 feet and 10,000 feet, and so auto-inflation is more necessary during the later stages of a descent than during the earlier; in practice it is usual to auto-inflate about six times from 20,000 feet to 10,000 feet and every 1,000 feet thereafter. Meteorological conditions do not affect the pressure very much, and the greatest change that could be produced by barometric disturbances on a horizontal flight would equal a descent of 1,000 feet from London to Edinburgh.

Clinical Findings

(i) *Eustachian Obstruction.*—In the series of cases examined the Eustachian obstruction encountered has been due to naso-pharyngitis, either catarrhal or mucopurulent. The leading symptoms are monotonous in their consistency. The patient reports complaining of a cold and that his ears are "blocked," and if he has flown before reporting he states that his ears have caused him "trouble." The presence of a nasal discharge is variable. The throat is not described as sore, but there may be a tickle due to the irritation of the post-nasal discharge. On examination the throat may show injection and there may be, but not necessarily, a post-nasal discharge. The drum is always examined, and in pure Eustachian obstruction is only slightly invaginated in appearance, but if the man has discovered his condition only through flying there may be barotraumatic appearances as well. On attempting auto-inflation no movement is observed and no subsequent click is heard. An important point is that, even in normal people, after prolonged attempts at auto-inflation the leash of vessels overlying the head of the malleus becomes engorged from venous back-pressure, giving a spurious appearance of "injected drum-head." But of course this is only a transitory phenomenon, a true injection of the drum from barotrauma persisting much longer. The problem arises whether the tubes are patent when there is no movement of the drum on auto-inflation. It is doubtful if this is the case in experienced fliers, whose drums usually move with an audible click. No movement, however, may be found in less experienced air-crew and, further, a previously damaged and scarred drum will often fail to move. These last conditions render the diagnosis of Eustachian obstruction dependent in a few cases on the individual's own statements. This of course raises the awkward problem of possible psychological reactions to flying, which is beyond the scope of this report. (The following figures have since been supplied: in a series of 2,000 ears examined the tympanic membrane was visibly mobile in 91.7%; the tubes were audibly patent in 49.8% and negative in 7.4%.) It is emphasized that

it is quite possible to have a "cold" and to experience no discomfort from the ears during flight owing to the Eustachian tubes remaining patent. Chronic rhinitis, mild forms of acute pharyngitis, and tracheitis do not necessarily curtail flying duties.

The pathology of the condition is conjecturally simple, although of course there has been no opportunity for verification in this series. The changes must either be a generalized catarrhal or occasionally inflammatory congestion in the epithelium—these cases give the sluggish response to auto-inflation—or there must be oedema of the adenoidal tissues at the pharyngeal orifice of the tube, giving a more substantial block. Among civilians, where the patients will not fall in the same healthy age group, the condition will be less simple. Adenoidal children will presumably present a special difficulty.

(ii) *Otitic Barotrauma.*—The symptoms are first a sensation of fullness in the ears, then increasing deafness, and lastly pain, which increases with the rate of descent and eventually becomes very severe. If no relief is obtained from opening the Eustachian tube the drum may eventually rupture. As the initial pain of a fracture may ease off in spite of persistent anatomical displacement, so may the initial pain of otitic barotrauma pass off to some degree in an hour or so after landing, giving rise to the false supposition that the Eustachian tube has opened. In mild cases many patients consider that there is wax in the external auditory meatus, and it is suggested that this is due to sensations from the auriculo-temporal nerve supply of the drum being referred to the lining of the meatus. Before proceeding further it must be admitted that, with the few cases seen, no hard-and-fast conclusions can be drawn. However, from these 10 cases certain tentative deductions can be made. Five only out of the 10 had colds before experiencing barotrauma, and so presumably there was no degree of Eustachian obstruction in the other five before flying. From the findings on examination of these 10 cases a rough classification under three headings has been made.

(a) Slight.—In heavy bombers this is the most common. There is slight impairment of hearing and the drum appears invaginated, injected, and indrawn. A number of the cases with Eustachian obstruction show mild degrees of barotrauma after discovering the disabling nature of their cold on short flying trips in the daytime, when there has been plenty of time for descent and repeated attempts at auto-inflation have been made. This stage is also seen in air-crew who have not had colds, but have lost the last 1,000 feet of descent rapidly. The majority of air-crew must have suffered from some trifling otitic barotrauma during their careers.

(b) Moderate.—The symptoms are the same, but height has been lost more rapidly and the trouble may have begun at a higher altitude and so there has been a longer strain on the drum. Hearing is more impaired than in the slight cases. An additional feature, however, is the appearance of haemorrhagic areas in the drum, usually in the postero-inferior quadrant, analogous to an ecchymosis of any other traumatized region. These haemorrhages are between the layers of the drum and may distort the drum features, or a solitary one may simulate a perforation. Recovery in these cases, as judged by the absence of symptoms on an air test, will take longer than in group *a*.

(c) Severe.—The findings are the same as above, but two complications can occur: first, a long-continued barotrauma may produce an effusion into the middle ear; and, secondly, the pressure may be so severe as to rupture the drum. The latter is very rare, and not one case has been seen in this 30-weeks period, nor, indeed, during twelve months with Bomber Command.

Treatment

Preventive.—Prevention is of the greatest importance from the Service point of view, and time spent by the medical officer in instruction in these conditions is well paid by the saving of time lost to the air-crews. It is the practice to see every air-crew on arrival at the station and to give a standard lecture on aviation medicine, including this condition. It may be argued that to dwell too much on the possible sources of a disability may be to sow the seed of a neurosis, but in this 30-weeks period this was found to be not true. With the aid of a diagram the elementary anatomy is shown and the Eustachian tube is likened to "an inch and a quarter of flabby drinking-straw" through which with a funnel it is possible to blow but not suck. This gets over the problem of why the air can get down but not up the tubes, whether it be the strict truth or not. The essential points in auto-inflation as described above are stressed along with a very practical point—namely, that the captain must tell his crew when height is about to be lost so that they can auto-inflate before the onset of symptoms. Only three of a crew can tell the altitude from instruments, and very often, if auto-inflation has not been carried out, the ears give the first intimation to the others that the aircraft is descending. It is obvious that methods of preventing nasopharyngitis are of paramount importance on flying stations, and at the lecture mentioned the equation "Infection + impaired individual resistance = cold" is stated as a binding truth. The infective factor is considered endemic, but the virtues of unimpaired resistance or positive health are stressed and attention is directed towards the three basic physiological requirements to achieve it—viz., food, sleep, and exercise. Facilities are also available for supplementing a very adequate diet by vitamin A and D capsules, which have an undoubted psychological effect on air-crew. Lastly, ultra-violet light is available, and a full course is recommended during winter months: colds do not exist among the really conscientious attenders.

Curative: (a) Eustachian Obstruction.—In the type of case most commonly seen pyrexia and systemic features are not necessarily present and in-patient treatment is not required unless there are urgent administrative reasons for intensive treatment. Eustachian obstruction arising from nasopharyngitis will disappear as soon as the congestion at the mouth of and in the lumen of the tubes has resolved. To facilitate this use is made of a standard treatment given in the out-patient department, and the patient reports three times a day. A sympatheticomimetic drug causing constriction of arterioles is used, and this can be supplied either with a nasal spray or in oily drop form. Opinion in this unit seems equally divided, but the oily drop method has the better theoretical chance of reaching the orifice of the Eustachian tube if given correctly. A prescription containing 0.75% ephedrine in liquid paraffin is used. It avails nothing if the patient sits in a chair and merely throws his head back; after blowing his nose he must lie horizontal over a couch with his head unsupported, and the head must be dorsiflexed on the neck until either the tip of the chin and the ear or the tip of the nose and the eye are in the same vertical plane. In this position three drops are placed in each nostril and have no option but to slide down into the nasopharynx when the head is raised with slight rotatory movements to ensure equal distribution. When the patient reaches an upright position proof of thorough administration is furnished by the desire to expectorate some of the solution that has slid over the soft palate. The patient waits three minutes for the ephedrine to act and then tries to auto-inflate. It may be argued that persistence in auto-inflation with nasopharyngitis may lead to the spread of infection to the middle ear. There has been no such unfortunate incident in this series. The patient now receives an inhalation. The standard inhaling earthenware pot is not necessary, for a saucer under a towel provides a wide evaporating surface, but of course does not give off vapour for so long. From observations in this series it is considered that the standard tinct. benzoin. co. is too weak for this purpose though of great use in other conditions. Better results are gained from vap. menthol et eucalypt. (*N.W.F.*), using a teaspoonful to a pint of hot water. When stocks are short a crystal of menthol in hot water is useful, as are a few drops, similarly used, of lin. methyl. salicyl., lin. terebinth., and even liq. picis carbon. Stocks of materials from which inhalations can be made are of paramount necessity at all flying stations. After receiving this treatment all sufferers feel their heads to be clearer, and it is necessary to detain them for a period before they proceed out of doors to meet a cold rush of air causing immediate hyperaemia of the nasal mucous membrane.

The man is examined after his first treatment and an opinion formed as to his fitness for flying duty. Even if the tubes are now patent a temporary limitation is given—not for barometric reasons, as will be understood from earlier remarks, but because it will ensure that he will only be able to fly on non-operational duties, where there will be plenty of time for descent and for auto-inflation should the obstruction recur. From the operational point of view, however, he is a "max night" lost. If there is still no patency of the tubes after treatment the patient is confined to ground duties. The averag

time for recovery to fitness for full flying duty has been found, as stated, to be 2.5 days. Dominion personnel are notoriously prone to catch colds, and recurrence of Eustachian obstruction is therefore common. In this series there have been approximately 17% of Dominion patients. After recurrence, evidence of possible sinus infection is looked for by transillumination and *x*-ray examination. The proprietary "benzedrine" or "karsodrine" inhaler is most convenient for air-crew, and those who have difficulty in auto-inflation often derive considerable benefit by using these before and after descent. Politzerization has its place in the treatment of Eustachian obstruction, and will be discussed later.

(*b*) *Otitic Barotrauma.*—The symptoms can be most satisfactorily relieved by immediate ascent to a height above that at which the barotrauma originally began and by subsequent slow descent with frequent auto-inflation. Indeed, many cases in which this has been done never find their way to the medical officer. But for military or meteorological reasons the danger to all the crew from delay caused by this manœuvre may outweigh the advantage to the individual, and so reascent may not have been carried out. On landing the individual must report for examination and treatment at the earliest opportunity, as the first essential is to get the Eustachian tubes patent. The regime outlined above is tried, and many cases respond within 24 hours. Valsalva's method is persisted with forcibly. If these simple measures fail and there is no purulent nasopharyngitis then recourse to politzerization is necessary. The nasal olive is too small for many nostrils, and a fellow medical officer has suggested the very useful practice of slipping over the olive a pierced rubber cap of a 10-c.cm. T.A.B.C. vaccine bottle as manufactured by the Lister Institute. This has proved most successful in securing a good airtight fit. The last stage in the therapeutic crescendo is Eustachian catheterization. In this series, however, this has only three times been necessary, and in the type of flying that will be experienced in peacetime passenger transports it should similarly be as seldom needed. After the tubes have become patent it is necessary to wait until the effects of the trauma to the drum have resolved before flying is recommenced, otherwise there will be pain on change of pressure. This is the time-consuming part of the treatment, which is purely "masterly inactivity," and accounts for the 20.4 days average stated above. Discoloration of the drum at the site of the haemorrhagic areas mentioned earlier may persist after freedom from symptoms, and the point can therefore only be satisfactorily decided after an air test, which is generally carried out around the 14th day.

Case Histories

Case 1.—Warrant Officer D. Diagnosis: nasopharyngitis and slight otitic barotrauma. Had a cold before flying. While listening to morse on descent from 20,000 ft. noticed that the signals were getting weaker. Then felt pain in both ears, increasing till 2,000 ft. Rate of descent 1,500 ft. a minute. Auto-inflation at 2,000 ft. with only partial success. On examination after removal of cerumen both drums injected, indrawn, and immobile on Valsalva test. Received drops and inhalations t.i.d. Next day right Valsalva was positive; left Valsalva still negative and nose catarrhal. Continued on same treatment for two days and then politzerized. Two days later left ear was very easily inflatable. Resumed full flying duty after total absence of five days.

Case 2.—Flying Officer W. Diagnosis: slight otitic barotrauma. No cold prior to flying. No record of altitude changes, and landed away from this unit with symptoms of barotrauma (left). Politzerization before return, and on arrival here complained of persistent aural pain. On examination drum injected and wrinkled in appearance. Two days later ear still painful; auto-inflation increased pain and caused further pain in left mastoid region. Three days later this mastoid pain was more severe, and relief was obtained only from resting on a hot-water bottle and from analgesics. Eventually fit for full flying duty after 12 days' absence.

Case 3.—Pilot Officer W. Diagnosis: slight otitic barotrauma. No cold before flying. Descended from 21,000 ft. and experienced pain in right ear to 15,000 ft. Pilot thereafter descended more slowly, but only partial success with auto-inflation. Three hours after landing flew again to 15,000 ft. with some relief. Reported four days later: Right drum injected, indrawn, and immobile. Politzerized next day by E.N.T. surgeon, with good air entry and some immediate improvement. Continued to receive inhalations, and resumed full flying duties after 25 days' absence. When examined 20 weeks later there were no signs of impairment of hearing.

Case 4.—Sergeant C. Diagnosis: severe otitic barotrauma. No cold prior to flying. No record available of altitude changes, but complained of immediate pain in right ear on descent. On examination the normal features of the tympanic membrane were obscured by "bubbles" due to a serous effusion in the middle ear. Received routine drops and inhalations, and two days later the Valsalva test became suddenly positive spontaneously, and on examination the bubbles were seen to have disappeared, to leave haemorrhage in the drum, which was mobile on auto-inflation. He then proceeded on nine days' leave, and on return the haemorrhages had resolved. He proceeded on non-operational flying duties, and after a satisfactory air test resumed full flying duties after a total absence of 20 days.

Case 5.—Sergeant M. Diagnosis: severe otitic barotrauma. No cold before flying. Aircraft involved in fast dive from 13,000 ft., and pain developed in left ear, becoming very severe. Captain reascended to above 10,000 ft. and pain eased off, but recurred again and was acute after landing. On examination the drum was intact and mobile on auto-inflation. Received drops and inhalations, and pain passed off completely. Six days later flew again and experienced pain from 4,000 ft. at three-quarters of previous strength. Next day, when examined by the E.N.T. surgeon, the drum was inflamed, was mobile on auto-inflation, and there were the remains of a serous effusion in the middle ear. Watch-tick heard only on contact, and Weber test referred to the right ear. Six days later the inflammation of the drum had subsided, and in a further seven days the hearing had returned to normal. Thirteen days later he resumed full flying duties after a total absence of 27 days.

Case 6.—Flight Sergeant T. Diagnosis: nasopharyngitis and severe otitic barotrauma. Coryza before flying. Pain in right ear on descent from 23,000 ft., increasing to a maximum at 20,000 ft. and then easing off. Reported next day. On examination nose inflamed, drum inflamed and indrawn with haemorrhagic posterior patch, and could just hear watch-tick against the ear. Politzerized by the E.N.T. surgeon next day. Seven days later cold persisted and the Eustachian tubes were catheterized by the E.N.T. surgeon. Thereafter auto-inflation daily and politzerization at unit on "negative" days. Eleven days later still—i.e., 20 days after barotrauma—patch still present on drum. Four days afterwards his cold had cleared, his drum appeared normal, and his hearing had returned. Resumed flying below 5,000 ft. After a satisfactory air test resumed full flying duties after 45 days' absence.

Conclusion

Once again it is stated that this paper does not attempt to give a comprehensive picture of otitic barotrauma, but merely depicts those features that have been observed with air-crews of heavy bombers by a unit medical officer. There is much more that could be discussed in the way of treatment—for instance, by those who have the opportunity of seeing more of these cases. Inhalation of helium–oxygen mixtures, drum punctures, and the implantation of radon tubes into the nasopharynx around the tubal orifices of patients with recurrent nasopharyngitis are all interesting remedial measures.

On R.A.F. stations there is no difficulty in the diagnosis or disposal of cases of severe otitic barotrauma, but the handling of air-crew with nasopharyngitis presents a problem that will be found in any form of aviation. It is hoped, therefore, that the remarks on prevention may be of interest and may indicate one way in which the medical branch, by applying the science of aviation medicine, can join with the other sections at R.A.F. stations in helping the air-crews to carry out their task in greater comfort.

Summary

During a 30-weeks period with a heavy bomber squadron of the Royal Air Force 56 cases of Eustachian obstruction and 10 cases of otitic barotrauma have been encountered.

From this series the importance of these two conditions, their anatomy, physiology, pressure changes, clinical appearances, preventive and curative treatment, and some case histories, are described and discussed with reference to civilian aerial transport.

Cases of severe otitic barotrauma have been found to be rare, and the incidence of all cases can be lessened by instruction in auto-inflation, by the prevention of nasopharyngitis, and by curtailing the flying duties of patients with Eustachian obstruction.

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A LABORATORY TEST FOR DIAGNOSIS OF SMALLPOX

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Experience of over 100 cases of smallpox studied in the Middle East has convinced us that a diagnosis of variola on the first and second day of the rash is often extremely difficult and that the differentiation of mild smallpox from varicella may be impossible throughout its course. The purpose of this paper is to describe the clinical application of a laboratory test which has helped us greatly in establishing the identity of variola in the first day or two. The test is based on certain points of distinction between the elementary bodies of variola and varicella found in the skin lesions of these diseases.

Historical

The viruses of variola and vaccinia were discovered in 1886–7 by Dr. Buist, of Edinburgh University Bacteriological Laboratory, who practised as a public vaccinator in the city. Unfortunately Buist failed to appreciate the nature of the tiny bodies which he found and called spores of micrococci, and it was not until 19 years later that Paschen (1906), of Hamburg, stressed their aetiological significance and named them "elementary bodies," followed by Eagles and Ledingham (1932) and others. (For historical notes see Gordon, 1937; and Mackie and van Rooyen, 1937.)

While the existence of the minute organisms has been known for many years, it is strange that few bacteriologists have attempted to utilize them for the laboratory diagnosis of smallpox, despite the fact that their biological characteristics have been extensively studied. (For review of literature see Smadel and Hoagland, 1942.)

In the past, three laboratory procedures—namely, the variola-vaccinia flocculation, the complement-fixation, and Paul's rabbit's cornea tests—have been employed for the diagnosis of human variola in the late stages of the disease. Tanaka (1902) demonstrated that if smallpox vesicle fluid was mixed with vaccinial lymph a precipitate developed; and later Gordon (1925) showed that extracts of variola scabs exhibited a specific precipitation effect when added to vaccinial antisera. The flocculation phenomenon was applied in medical practice by Burgess, Craigie, and Tulloch (1929), who used it as a confirmatory test in mild smallpox as well as a laboratory procedure for the identification of clinically atypical cases occurring in Dundee (see also Craigie and Tulloch, 1931; Tulloch, 1934; Craigie, 1932a and 1932b).

Specific complement-fixation reaction for variola has been practised for many years, and in particular by Beintker (1908), Sugai (1909), and Kolmer (1916). In recent times Gordon (1925) proved that the specific deviation of complement by the interaction of extracted variola scabs (or vesicular fluid), as antigen, with antiserum derived from convalescent smallpox patients or vaccinated rabbits could be of diagnostic help. The modern technique of the variola-vaccinia complement-fixation tests is described by Craigie and Wishart, 1934a, 1934b, 1935, 1936a, 1936b, 1936c; and Tulloch, 1940.

Paul (1919) showed that, if a rabbit's eye was scarified with variolous material, after 48 hours the animal developed acute kerato-conjunctivitis, accompanied by the formation of acidophilic intracellular Guarnieri inclusion bodies (Guarnieri, 1892) in the epithelial cells of the cornea. Paul's test has been extensively used by Scott and Simon (1923), who have recommended a technique whereby the test can be completed within three days.

The present report deals with the prompt recognition of variola by identifying the causal agent of the disease in human skin lesions during the early stages of the malady, when the virus is easily visible.

Method of Examination

Apparatus.—A sharp-pointed scalpel and two highly polished slides cleaned with potassium bichromate and sulphuric acid solution are required for each case. *Microscope:*—The best instrument available should be employed, and should be fitted with a good substage condenser, a 1.4 N.A. apochromatic 1/12-inch oil-immersion objective, and a × 10 or × 12 compensating eyepiece giving a total magnification of 1,000 diameters. The ideal source of light for critical microscopy is the low-voltage high-intensity electric light bulb, used in conjunction with a light-blue ground-glass filter and condensing lens. For technical details of optical equipment suitable for virus research see van Rooyen (1937).

Staining Reagents Required.—Löffler's flagellar mordant, which is made up as follows: 20% aqueous solution of tannic acid, 100 c.cm.; saturated solution of ferrous sulphate, 50 c.cm.; and saturated alcoholic solution of basic fuchsin, 20 c.cm. It should be allowed to stand for three days and then be filtered before use. *Carbol Fuchsin Stain:*—Two stock solutions are stored separately; they consist of (*a*) 0.3 g. of basic fuchsin in 10 c.cm. of ethyl alcohol, and (*b*) 5 g. of phenol dissolved in 95 c.cm. of distilled water. One part of solution *a* and nine parts of *b* are mixed together and filtered before use.

Collection of Specimens.—Six early lesions are selected, preferably fresh vesicles containing clear fluid, and these are opened with forceps. The base of fully formed papules can also be scraped, and when opening these one must try to avoid drawing blood. If the lesion is a vesicle the fluid is first absorbed with cotton-wool. The base of the exposed cavity is then firmly scraped with a sharp knife or the corner of a glass slide, and the material obtained is rubbed with a rotary motion on the surface of a glass slide. Three such smears can be made on each slide. The best results are obtained by scraping the earliest papular and vesicular lesions of smallpox; consequently pustules should be avoided, as these often contain artefacts.

Paschen's Staining Method.—Slides are placed upright in distilled water for from 2 to 15 minutes, according to thickness of the smear, and then allowed to dry in air. They are treated with ether, and then with alcohol for two minutes. The alcohol is poured off and the films allowed to dry. *Filtered* mordant is added, the films are heated very gently, and the mordant is allowed to act for three minutes. They are washed repeatedly and very thoroughly with running water for two minutes. Diluted and *filtered* carbol fuchsin stain is poured on and gentle heat is applied until the steam rises; the films are left for seven to ten minutes, and then washed with water. (If necessary any excessive deposition of stain is removed by a rapid application of a few drops of alcohol and by washing in water.) They are dried, blotted, and mounted in neutral Canada balsam.

Bad results are attributable to failure to wash off all traces of the mordant with water before application of carbol fuchsin, or to drying of the mordant or stain by overheating and precipitation of carbol fuchsin dye so as to leave a granular background. (Such films should be discarded.)

Essential Control Preparations

Before searching a stained slide from a suspected case of smallpox for elementary bodies it is imperative to familiarize oneself with the appearance of control slides—two negative and one positive. The former should consist of: (*a*) a slide showing a pure culture of *Staph. aureus* or *albus* stained by Paschen's method; (*b*) a good film showing the elementary bodies of varicella: these are not easy to demonstrate, and it may be necessary to make several scrapings before a characteristic film of varicella elementary bodies can be obtained from a case of chicken-pox. The positive control should be a film which is made from a typical case of variola stained by Paschen's technique and which shows "myriads" of elementary bodies.

Points to be Remembered when Searching Films

In interpreting the results of stained films one should *never* state that elementary bodies are present unless masses of them are found. Moreover, these should be of uniform shape and of regular size and be clearly stained a deep red, identical in appearance with the positive control. Pleomorphic granules, deposited stain, and isolated single or scattered elementary bodies, however suggestive in appearance, should be ignored. To diagnose variola on the presence of scanty elementary bodies in a suspected film will inevitably lead to disastrous conclusions.

In the event of doubt one must discard that particular film and examine the next preparation: hence the reason why at least six smears should be made from every suspected case. In the average case of variola at least three of the slides will show numerous elementary bodies without much searching, and their appearance is so striking as to leave no room for hesitation.

If all the slides are doubtful or completely negative then that can be interpreted as strong presumptive evidence against the diagnosis being one of smallpox. In such circumstances the laboratory examinations should be repeated the next day. An attempt can also be made to isolate the virus by rabbit inoculation, but this procedure is both uncertain and slow.

The Elementary Bodies of Varicella, Variola, and Vaccinia

When viewed under the same optical conditions the elementary bodies of variola and vaccinia are identical in size but are larger than those of varicella. Certain other subtle differences can also be detected, such as avidity for carbol fuchsin dye and relative numbers in infected tissues.

The accurate measurement of stained microscopical objects of the dimensions of elementary bodies is a difficult task. Several technical methods have been evolved for the purpose, but none of them is perfect. One principle, advocated by Coles (1929), is Nelson's (1909) method of micrometric extinction performed with a dry high-power objective fitted with a graduated iris diaphragm calibrated against an apertometer. Using such a device, van Rooyen and Rhodes (1940) estimated vaccinia virus to be 0.25 μ in diameter. In the present studies the elementary bodies of variola and varicella have been measured. The former were found to vary from 0.3 to 0.24 μ, and thus were of approximately the same size as vaccinia virus. We have also repeatedly noticed that the elementary bodies were not only easier to demonstrate during the papular eruption of smallpox but appeared to be larger than those demonstrated later in the same case, at the stage of pustulation.

Smears showing elementary bodies of varicella were also measured and compared with those of variola, and were found to range from 0.125 to 0.175 μ in diameter. This difference can easily be appreciated by the naked eye, and was first noted by Paschen (1933), who referred to the "essentially smaller size of the elementary bodies of varicella," as well as their poor staining affinity, in the following paragraph:

"Vor 15 Jahren habe ich auf der Versammlung der Vorstände der Staatlichen Impfanstalten berichtet, dass ich in Ausstrichen von ganzfrischen Varizellen-Bläschen E.K. gefunden hätte die wesentlich kleiner als die bei Variolavakzine beobachteten waren und sich schlechter färben liessen."

We have confirmed Paschen's findings and have appreciated that the difference in size between these two varieties of elementary bodies is great enough to permit it to be utilized as a laboratory diagnostic principle. Subsidiary points of distinction observed by ourselves are as follows:

In variola they appear in "myriads," whereas the elementary bodies of varicella are relatively scanty, are hard to detect (stained by Paschen's method), and usually leave some doubt in the microscopist's mind whether they are real or artefacts. Moreover, only a small proportion of films made from typical vesicles in a case of varicella show elementary bodies, whereas in variola the reverse is true. In the early smallpox rash elementary bodies occur intracellularly in masses and clumps as well as in the form of clusters of extruded bodies in the proximity of ruptured epithelial cells. Another common appearance is the tendency to form long rows of bodies stretching from ruptured infected cells across the film. These appearances are rarely observed in varicella.

Varicella cannot be diagnosed by the film method, and one must resist the temptation to try to do so. The elementary bodies of varicella are exceedingly small, are too scanty, stain with difficulty, are often hard to find in films prepared from vesicles, and are readily confused with stain deposit.

The elementary bodies of variola and varicella can also be demonstrated under the dark-field-illumination microscope. Unfortunately artefacts are impossible to identify by this method, and consequently oblique illumination of unstained material should be restricted to the examination of infected tissue cultures and other special purposes. This unreliable method must never be employed in routine smallpox diagnosis, and far less for attempting to differentiate between the elementary bodies of variola and varicella. (See van Rooyen and Rhodes, 1940.)

Vaccinia.—Since the elementary bodies of vaccinia are morphologically indistinguishable from those of variola, the direct film method is not applicable to their differential diagnosis. However, this is not a serious obstacle, because the natural disease is confined to agricultural communities, and large outbreaks of cowpox are (at least in Egypt) uncommon. Even if an occasional case were wrongly labelled as smallpox no damage would result from any preventive measures which might have been instituted at the time. As for generalized vaccinia following vaccination, the history of inoculation, together with the patient's clinical state, should be enough to exclude variola.

Correct Wording of Laboratory Reports

It is imperative to adopt a uniform phraseology in recording results, so that both the bacteriologist and the clinician may serve the best interests of the patients. Two stereotyped examples of laboratory answers are recommended: (1) Positive for variola-vaccinia group. (2) Nothing found. If the case remains in doubt scrapings are repeated next day. Repeated negative results are suggestive of varicella—if the clinical diagnosis justifies it.

The Test in Varicella

Egypt

(*a*) During March–April, 1943, approximately 2,000 cases of chicken-pox and 3 cases of smallpox occurred in an isolated group of West African troops during sea transit from the Belgian Congo to Egypt. The R.M.O. in charge, Capt. Logie Bain, R.A.M.C., informed us that the whole unit had been well vaccinated within a year and that, except for the three typical instances of smallpox mentioned, the cases were in every way characteristic of varicella. Skin scrapings were duly obtained from 60 typical cases of varicella by Major Hartston, R.A.M.C., D.A.D.H. to the camp, as well as from the 3 cases of variola. The results showed that whereas in the cases of smallpox elementary bodies were easily demonstrable, they were usually absent or difficult to find in the patients suffering from chicken-pox.

(*b*) A group of 6 cases with a vesicular rash not due to smallpox were investigated in another military hospital. Four of these had chicken-pox, one a vesicular rash of unknown cause unlike smallpox, and one a fine pemphigoid rash very closely resembling smallpox. The test was of great value in these cases. In this area smallpox is ten times as common as chicken-pox, and a diagnosis of chicken-pox had to be made with great caution in view of the prevalence of mild modified smallpox in vaccinated personnel. One of the cases of chicken-pox had a prodromal scarlatiniform rash and three vesicular lesions on the sole of one foot; but these lesions were not hard and shotty as those of smallpox, and the subsequent fully developed distribution of the rash showed that the case was one of chicken-pox. The absence of elementary bodies of smallpox in the scrapings was a help in diagnosis. Another case of chicken-pox had an unusual number of lesions on the forearm, giving rise to doubt about the diagnosis; but the absence of elementary bodies in the scrapings helped the diagnosis, which was confirmed by the distribution of the rash when it was fully developed. The pemphigoid rash was at first thought to be smallpox, but repeated scrapings from

lesions failed to reveal the elementary bodies of smallpox, and the subsequent course of the rash showed that it was septic in nature. The negative laboratory finding was therefore of as much value in these cases as were the positive findings in some of the cases of small pox.

England

Although the cases affecting West African and Belgian Congo soldiers were unquestionable examples of adult varicella, studied before epidemic smallpox had begun in Egypt, to be doubly assured of our facts we decided to obtain a second series of control scrapings from genuine chicken-pox cases from independent reliable sources in Great Britain, where all chance of possible contact with variola could be excluded. This was done in June and July, 1944, when Great Britain was free from smallpox according to published information on infectious diseases and vital statistics. Major (Miss) Janet Niven, R.A.M.C., and Dr. E. M. Young provided us with skin scrapings from a total of 16 different typical cases of adult and juvenile chicken-pox contracted in Wiltshire and the S.E. London area. All these were carefully stained and examined under identical conditions with similar scrapings obtained from cases of variola acquired by British troops in Egypt. The results showed that the morphological picture presented in stained skin scrapings from cases of varicella, whether acquired in Egypt or England, were the same. Of a total of 88 well-prepared smears from 16 patients, typical exceedingly minute varicella elementary bodies were found in 12 smears from 4 cases. The latter were compared with typical Paschen bodies of early smallpox, and the difference was immediately recognized.

The Film Test in 80 Cases of Variola

Results in 50 Test Cases affecting British and Other Soldiers

Scrapings from lesions were taken in 50 out of 100 cases of smallpox seen by one of us (R. S. I.) at a military hospital in the Middle East. The cases chosen for the test were of all degrees of severity. Eight of the 50 were extremely mild throughout, while 10 were of the very severe type, of which seven were haemorrhagic. In 10 of the 50 cases the rash was in the papular stage at the time when scrapings were taken, in 39 the rash was vesicular, and in 1 it was in the early pustular stage. In 47 (94%) the scrapings showed the elementary bodies of smallpox, and in 3 (6%) they did not. Every positive laboratory diagnosis was subsequently confirmed clinically. In 21 of the 50 cases the diagnosis of smallpox was obvious at the time when the scrapings were made. Scrapings were taken from these cases, which were early ones in the series, in order to check the validity of the method. In 23 of the cases the diagnosis was not obvious at the time when the scrapings were taken, but became so later. Thus the laboratory diagnosis was made before the clinical diagnosis was possible. In 6 cases the clinical diagnosis was not clear when the scrapings were taken, and from the appearance of the rash did not become so later, but the laboratory result was confirmed by other means—notably by the history of close exposure to infection at the appropriate interval before the development of the disease. Three of these six cases figured in an interesting local outbreak in which the laboratory test was of real value in diagnosis.

A Jamaican was admitted with a very sparse vesicular rash of about 20 to 30 spots, none of them on the palms or soles, which had been preceded by three days of fever. He had scratched almost all the spots, but an attempt was made to obtain scrapings from the remaining one or two unscratched lesions. The scrapings did not show the elementary bodies of smallpox, and it was not possible to repeat them as there were no remaining lesions suitable for the test. No new lesions developed, and it was never possible to distinguish the rash from chicken-pox, but the three-day prodromal fever made the diagnosis of smallpox likely. He was kept in an observation tent separate from known cases of smallpox, vaccinated, and notified as having smallpox so that unit precautions could be instituted. Twelve days after his admission two more Jamaicans were admitted with a still more sparse rash, which had appeared 1 to 2 days after the onset of fever. Chicken-pox was diagnosed, but scrapings showed the elementary bodies of smallpox. Neither developed further lesions, and it was never possible to distinguish them from chicken-pox by their appearance. But two days later three others were admitted—natives of Jamaica and British Guiana—all with a vesicular rash, two of them characteristic of mild smallpox, with lesions on palms and soles, and the other indistinguishable from chicken-pox. All had developed the rash on the same day as the fever. Scrapings were taken from one of these cases, and they showed the elementary bodies of smallpox. It was then found that all these six cases had come from the same hut in the same unit. Twelve days later three others were admitted from the same hut, all with obvious mild smallpox, and the scrapings from all three showed elementary bodies of the disease. One of these three had the classical three-day prodromal fever before the rash developed. All the 9 cases had been very recently "vaccinated," and the clinical diagnosis was difficult at first in all and impossible throughout in four. The laboratory test was here of great value in establishing the nature of the outbreak.

The test was of great service in the early diagnosis of many of our cases. In 22 of them the scrapings were taken on the first day of the rash, at a time when a clinical diagnosis was usually difficult or impossible, and all these scrapings showed the elementary bodies of smallpox. In 4 of these 22 cases the laboratory diagnosis was actually made on the first day of the disease, because the rash had developed on the same day as the fever. One of our early cases which developed the rash—not a prodromal one—on the same day as the fever while in this hospital presented great difficulties in diagnosis. This patient developed a very severe form of the disease, which was fatal, and the laboratory report was a great help in the diagnosis, which was subsequently obvious.

In many of the cases the rash was extremely sparse when the scrapings were taken, there being 12 to 24 lesions in all. In a Cingalese boy there were only 12 vesicles when the test was made, the rash having appeared on that day. In another case 12 to 15 papules were found on the back of a man who had had fever for three days. They were non-specific in character, but, by carefully opening the papules without drawing blood, scrapings were obtained which showed the elementary bodies of smallpox. It was not possible to make a clinical diagnosis in this case until 36 hours after the scrapings had been taken, and he was therefore kept in an observation-room until the diagnosis became clinically obvious.

In 3 of the 50 cases elementary bodies of the disease were not found in the scrapings. Only one series of scrapings was taken in each of these cases, and it is likely that if the series had been repeated a positive result would have been obtained. One was the Jamaican patient mentioned above in whom there was a scarcity of lesions suitable for the test. The other two were typical mild cases of smallpox.

Independent Observations in a Further 10 Selected Cases

At another military hospital the film method of diagnosis was put to a critical trial by Lieut.-Col. H. L. Wallace and Major R. W. Eason in 12 patients who had been admitted to the general wards of the unit, labelled pyrexia of unknown origin, and who subsequently developed a rash in hospital. Skin scrapings were made at the first signs of the appearance of the rash, usually on the second or third day of illness. Ten were reported as positive, and all ten cases subsequently proved to be typical smallpox. One patient had been admitted to hospital at the height of the typhus season, and the rash was strongly suggestive of epidemic typhus, but the diagnosis was changed to variola on the findings of the film test. The man later proved to be a case of haemorrhagic smallpox, and died. Another case was of particular interest. The illness was exceedingly mild, and the patient, who had been under treatment for another complaint, had fully recovered and, while waiting to be discharged as cured, was working as a voluntary helper in the wards distributing bedding and linen to others when it was noted that he had developed a few red spots on the arms and trunk. A film scraping proved to be positive and seven days later the diagnosis became apparent. In the two remaining cases the film test was repeatedly negative, both ultimately proved to be septic skin conditions, and no secondary cases developed from them.

Results in 20 Civilian Cases of Late Smallpox

Twenty late fully developed severe cases of pustular semi-confluent smallpox affecting Egyptians were investigated. Film

were prepared from these subjects, duly stained and examined. The results showed that, although elementary bodies were present in considerable numbers, they are difficult to detect after pustulation and secondary infection has occurred. Prolonged immersion in distilled water is required to rid the film of excess serofibrinous pus, and the film tends to overstain. Nevertheless even in late cases, by scraping the base of the pock, it is possible to obtain excellent stained preparations showing elementary bodies.

Discussion

To perform either the complement-fixation test or the variola-vaccinia flocculation test vesicular fluid or dried scabs are required, or the serum of patients 7 to 10 days after infection. In consequence their use is restricted to cases in the stage of pustulation or desquamation. Moreover, both tests demand a high standard of serological technique with proper controls, and about 24 hours must elapse before results can be read. Paul's test likewise suffers from the disadvantage of the time taken to obtain an answer. Moreover, our experiences with Paul's test in true smallpox have been disappointing, and it is not as easy to do as the literature indicates it to be. The slide method provides a quick and easy test for recognition of smallpox from the first day of the rash, when it is in the papular stage before vesiculation. A smear preparation can be made from a suspected case of smallpox, stained, examined, and a reply handed to the physician in half an hour. To assess the relative merits and percentage of experimental error in different laboratory tests would be unfair without comparative trials over a large series of cases. However, we believe that if all the laboratory diagnostic methods for variola were put to a rigid trial and judged according to their merits the slide technique would surpass the remainder in speed and accuracy.

Summary

We have confirmed Paschen's (1933) observation that the elementary bodies of variola are larger than those of varicella, and have utilized this finding to form the basis of a laboratory test for the identification of smallpox.

In Egypt, skin scrapings from 80 cases of smallpox ranging in severity from mild to fatal haemorrhagic variola were subjected to the film test for elementary bodies.

The laboratory and clinical findings corresponded in 77 cases (i.e., 96%). A negative result was returned in three cases of smallpox.

Variola elementary bodies were demonstrated with ease in the papular and vesicular stages of the illness, but after the onset of pustulation they tended to disappear.

In 32 cases of early smallpox the laboratory answer was positive on the first day of the rash, when it was very sparse and the clinical diagnosis was difficult or impossible to establish.

In no instance did a positive laboratory verdict disagree with the final clinical diagnosis of the case.

Control skin scrapings from 64 clinical cases of varicella occurring in Egypt, together with a further 16 cases of chicken-pox contracted in England, have been studied under identical conditions and compared with similar material from 80 cases of variola in Egypt.

The film test is not applicable to the diagnosis of chicken-pox, because the elementary bodies of varicella are too small, are too scanty, and show feeble affinity for Paschen's stain.

The principal conclusion reached is that the film method, when used with caution and discretion, can be of great value in the early recognition of variola, especially on the first day of the rash, when the clinical picture may so closely simulate chicken-pox.

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AIR EMBOLISM AS A COMPLICATION OF VAGINAL DOUCHING IN PREGNANCY

BY

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The potential dangers of air embolism during surgical procedures are well known, and are being constantly emphasized by all those responsible for surgical teaching. Within recent years the importance of this subject has increased proportionately to the frequency with which intravenous resuscitation therapy is employed. According to Hamilton and Rothstein (1935) the first case was reported by Beauchesne in 1818, and since then many other accounts of fatal accidents due to air embolism have been placed on record.

The Causes of Air Embolism

When any large vessel containing blood under less than atmospheric pressure is opened and cannot collapse owing to rigidity of its walls, partial severance, or external fixation, the entry of air is possible and the mechanism easily understood. This may happen during operations in the region of the great vessels of the neck, as a sequel to their traumatic severance, and through opening the dural sinuses during operations on or within the skull. A somewhat similar situation exists when air enters the uterine venous sinuses during or after delivery. This may happen in normal healthy women during labour when the sinuses are open after detachment of the placenta (Osborn and Dawson, 1938), or up to 11 days post partum where retained membranes, clot, or placental fragments have kept the sinuses open and the entry of air into the uterine cavity has been facilitated by the adoption of the knee-chest position (Gough, 1924; Quigley and Gáspár, 1936; Stroh and Olinger, 1938; Redfield and Bodine, 1939). In these circumstances the air is sucked into the open vessel. Criminal abortions are often attempted by the injection of fluid into the uterus. If the fluid passes the cervix its force detaches the membranes or placenta and air may be driven into the open uterine sinuses, as precautions are seldom taken to ensure that the syringe is completely filled with fluid before use (Gonzales, Vance, and Helpern, 1937; Gough, 1924; Hamilton, 1936).

The fact that even quite small veins may, if damaged, serve as a point of entry for air is perhaps not so widely known.

This is particularly liable to happen if the air is under pressure. This mechanism operates when air embolism occurs during antral lavage (Gording, 1920; McGovern, 1941); during the distension of the bladder or urethra with air (Mathé, 1929; Rettig, 1930; Jeck, 1933; Dible *et al.*, 1938), while testing the patency of the Fallopian tubes by insufflation (Moench, 1927; Mansfield and Dudits, 1934), during therapeutic vaginal insufflation (Latham Brown, 1943; Peirce, 1936; Partridge, 1943), and as a result of perirenal insufflation for diagnostic purposes (Weyrauch, 1940). In these circumstances the vessels may be either diseased from inflammation or tumour growth, or damaged before or during the operation. Finally, the injection of air into the peritoneal cavity or the administration of fluids intravenously may result in air embolism.

When air embolism arises under the conditions outlined above the gas accumulates in the right side of the heart and the emboli lodge in the lungs, except in those exceptional cases in which a patent foramen ovale or interventricular septal defect exists, when a proportion of the air may reach the main circulation. Cerebral and coronary air embolism are common sequelae of penetrating wounds of, and operations on, the lungs, and of the induction of artificial pneumothorax in the treatment of pulmonary tuberculosis (Chase, 1934; Hamilton and Rothstein, 1935). Many authors suggest that a proportion of the cases previously regarded as fatalities due to pleural shock have in fact been unrecognized cases of air embolism.

The Mechanism of Death in Air Embolism

The effects depend on whether the pulmonary or systemic circulation is invaded. In the former case the air accumulates in the right auricle and ventricle, and emboli are impacted in the pulmonary arterioles. If the volume of air is large and it enters the circulation quickly death takes place rapidly. It is still apparently not settled whether death is due to mechanical interference with heart function, to blockage of the pulmonary artery by froth with arrest of the circulation in the lungs, or to multiple emboli choking the finer arterioles in the lungs. If the volume of air admitted is smaller or its entry slower and life is prolonged, the air blocking the pulmonary arterioles may be absorbed in part. The remainder may escape through the capillaries and veins, thus finding its way to the left side of the heart and into the systemic circulation, to produce cerebral and coronary infarction. In the ordinary case of pulmonary air embolism this is rare, and the experiments of Jung and Pierre (1935) confirm that opinion. The work of E. and A. Curtillet (1939) and of Chase (1934) tends to show that the actual obstruction occurs in the arterioles, and that while there impacted the air bubbles become smaller owing to absorption. After a time the bubble, now reduced in size, escapes into the capillaries and so to the veins. In the average case, however, life is not prolonged sufficiently for this to happen. When the systemic circulation is invaded from the vessels of the lung, either primarily or as a sequel to pulmonary air embolism, the mechanism of death and the symptoms are different. The air blocks the vessels of the brain, interfering with the nutrition of the vital centres, and/or it lodges in the coronary vessels, producing cardiac infarction.

The Volume of Air

There seems to be no measure of agreement as to the volume of air required to bring about a fatal issue. Hamilton and Rothstein (1935) assert that small amounts of air can be introduced into the venous system with impunity, while Mathé (1929) believes that small volumes cause only mild transitory symptoms, which resolve when the air is absorbed. These opinions seem reasonable when one considers the numerous occasions on which intravenous therapy is administered, often by comparatively inexperienced operators, and the relative rarity of fatal air embolism during such a procedure. It seems almost incredible that in nearly all cases the operation is carried out without some small leakage of air into the vein through faults in the transfusion apparatus or directly when the vein has been opened to insert a cannula. Dible *et al.* (1938) consider that in nearly all cases of recorded fatalities considerably more than 100 c.cm. of air was introduced in a short period of time. Coles, Richardson, and Hall (1937), applying to man the results they obtained in experiments on dogs—which may perhaps not be justifiable—conclude that a minimum of 480 c.cm. of air is required as a lethal quantity. It is probably not possible to arrive at a definite figure. According to Simpson (1942) the total volume of air that can be tolerated depends on the person's general condition and on how quickly the air is admitted. He claims that sometimes even 10 to 15 c.cm. may be fatal. In Mathé's (1929) opinion marked differences in resistance to air embolism exist in different individuals and different species.

Case Report

History.—Recently a case occurred which in several respects was unusual and which points to a danger probably not generally recognized. A woman aged 34 who had had three previous pregnancies complained of feeling in poor health on June 30, 1943, but attributed her symptoms to the onset of menstruation. She usually had dysmenorrhoea severe enough to require two or three days in bed. She began to menstruate on July 1. Next day no fresh symptoms appeared till 9.50 p.m., when she collapsed on her way to bed and died a short time later. No further details were available at the time of the necropsy, and there was nothing to suggest what the cause of death might have been.

Necropsy.—The examination began at 3 p.m. on July 3—i.e., 17 hours after death—and putrefaction had not started. There was a blood-stained sanitary towel between the legs, but the external examination revealed nothing of significance. On opening the abdomen a retroverted gravid uterus was observed which was not impacted and could easily be lifted out of the pelvis. The peritoneal surface of the genito-urinary organs was uninjured. The bladder and urethra were healthy and free from injuries, and the ureters and kidneys were also healthy. The external genitals and vagina were free from abnormalities. The cervix was soft, and an erosion was seen round the external os. The cervical canal was open, but the cervix showed no sign of injury. On opening the uterus the placenta was found low on the right lateral wall, and its lower edge was detached to a depth of one inch. The membranes were separated to a depth of two and a half inches. The uterus contained a foetus of three months' gestation in intact membranes. In the wall of the uterus there were a few small subserous fibroids. The ovaries and tubes were healthy, and in the right ovary there was a large corpus luteum of pregnancy. The trachea contained some fine froth, and the pleural cavities were dry and normal in every respect. The lungs were very oedematous. The pericardium appeared normal. The right side of the heart was dilated, and on opening it the auricle and ventricle were found to be filled with frothy blood. The pulmonary artery contained identical material. The tricuspid valve was relatively incompetent. The foramen ovale was patent, but the opening was valvular. The left side of the heart was healthy, as were the coronary vessels and the myocardium. The alimentary system presented no significant abnormality. The meninges were normal, but there was some congestion of the brain. No haemorrhages were seen on the surface or in its substance.

Histologically the brain was free from abnormalities. Sections of the lungs showed numerous small areas of infarction with normal lung tissue intervening. In the infarcted areas there was intense congestion, with abundant oedema fluid in the alveoli. Some of the alveoli were filled, partly or entirely, with packed red cells.

Discussion

In the entire absence of any history to suggest it, the possibility of air embolism was not thought of before the necropsy, and consequently the special technique usually followed in such cases was not adopted. However, the findings indicate conclusively that this was the cause of death. In the light of this discovery the obvious suspicion was that this case was one of criminal abortion, and further inquiries were instituted. These revealed that this woman had not missed a menstrual period, and on June 3, 4, and 5 she was medically attended for dysmenorrhoea. So far as can be ascertained neither her husband, relations, intimate female friends, nor her doctor knew that she was pregnant. There is definite evidence also that during one of her previous pregnancies she continued to menstruate for three months after the pregnancy began. From all the circumstances of the case there seems, therefore, to be some genuine doubt whether the deceased realized she was pregnant. She was accustomed to using a Higginson's enema syringe for vaginal douching and, though no definite evidence on this point was forthcoming, it seems likely that she douched immediately before retiring at 9.50 p.m. on July 2. The fatal douching which was responsible for the air embolism must have occurred shortly before her collapse, and the above seems a reasonable hypothesis. It therefore appears fairly certain that

this death was accidental, the woman being in ignorance of her condition and police inquiries having failed to reveal the possibility of interference by any third party.

It is of course accepted that air embolism may occur when an attempt is made to inject air or fluid, or both, through the cervix with the object of producing an abortion. There are three cases on record in which therapeutic vaginal insufflation during pregnancy had resulted in death from air embolism. So far as can be ascertained, however, there is no previous report of an instance in which simple vaginal douching led to air embolism from detachment of the placenta.

This case is one of pure pulmonary air embolism. The finding of the patent foramen ovale at once raised the possibility that air would be found in the cerebral vessels also. Presumably the valvular nature of the very slight septal defect prevented this.

Summary

The causes of air embolism are reviewed and the mechanism of death due to this condition is discussed.

A case of accidental death from air embolism due to vaginal douching during pregnancy is recorded.

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ACTIVE CONVALESCENCE OF HERNIAL REPAIRS

BY

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During investigations into the causes of the high incidence of post-operative respiratory complications in Service cases it was shown that the incidence and intensity of symptoms were lessened in those cases specially liable by early movement and, in particular, by getting up out of bed. The type of case with the highest incidence was the group of hernial repairs and to a lesser extent appendicectomies. It was therefore determined to get all these men up the next day after operation, and the consent of the consulting surgeon of the Command was obtained to take a course of action contrary to the usual practice and contrary to the instructions later issued in the *Army Medical Bulletin*.

At the beginning of this investigation various operations were used—viz., Bassini, simple removal of sac, fascial graft, and finally the slide repair as described by Tanner (1942). As the series went on the operation of choice became the simple removal of sac, and the value of this decision was later emphasized by the survey given by Maj.-Gen. Max Page (1943) and others at the Royal Society of Medicine, which had not been published when this step was taken.

It has generally been agreed that the results of operations are not as satisfactory when a thorough investigation is made as is the impression of many surgeons who have not kept strict figures. Various critical reports have shown a recurrence rate between 0 and 20%, but among the most valuable published figures are those of St. Thomas's Hospital of 12% (1943).

The cases described have been an unselected series in men of military age. The great majority of them have been indirect inguinal herniae. Direct herniae have been operated upon only when there is evidence of a funicular sac coming down into the scrotum. Those with only a diffuse bulge have been advised against operation, as it is felt that the likelihood of strangulation is negligible. Nevertheless, some errors of diagnosis were made earlier in this series.

Many factors are involved in producing successful results, and in all probability no one factor is paramount. Much stress has been laid on the type of operation, but probably the truth is that no one type will meet all conditions and that a certain number of recurrences are the result of a faulty choice of operation.

There are several recognized factors of importance, of which some are the care of adequate haemostasis, strict aseptic technique, and the removal of the whole sac as far back as the "corn" which marks the position of the neck of the sac. I deprecate the use of gauze dissection as a means of separating the sac, though some have argued that good results follow the formation of a firm mass of inflammatory scar tissue. This, however, will certainly stretch under strain in a way normal tissue will not.

The great value of the Tanner slide operation where the inguinal ring is much enlarged is that the action of the arcuate fibres of the internal oblique is not interfered with. If their attachment to the conjoined tendon is slackened before suture their direction of pull remains normal. The hernial ring is closed against intra-abdominal pressure by the constriction of the arcuate fibres of the internal oblique, which, in contracting between its two attachments on Poupart's ligament and the conjoined tendon, flatten the arch, approximating the top of the arch to Poupart's ligament. It is essential that this muscular mechanism should be maintained in good activity. Therefore every opportunity must be taken, by free movements of the patients, to prevent adhesions forming between the internal and the external oblique. This is a matter of great importance, seeing that the likelihood of respiratory complications is so high. The strain placed on the inguinal canal by coughing is considerable, and it is apparent that anyone who could cough and vomit after operation certainly could sit in a chair without any increased risk and with greater comfort.

There is much difference of opinion in regard to the choice of suture material, and there are responsible advocates for the use of catgut or of more permanent sutures such as silk or linen thread. In this series I have used catgut throughout. Floss silk, so enthusiastically described by Maingot (1941), has not been employed at all, for I have had through my hands three cases of prolonged sepsis and sinus formation after the use of this material. Whether thread or catgut is chosen is probably a matter of no great importance so long as strict aseptic precautions are maintained. The post-operative dressing which has been used as a routine has been a thin layer of gauze stuck on healthy skin by mastisol. This has been done to avoid the inevitable moisture from sweating which is present when both elastoplast and bulky wool and bandage dressings are employed.

In the previous article (Martin *et al.*, 1943) we demonstrated that the choice of anaesthetic is a matter of little importance. I feel that the choice of an anaesthetist is of far greater moment. The only break with convention has been in the after-care. Active convalescence has been found to be of value in many conditions, and is practicable after herniotomies and appendicectomies when a muscle-splitting operation has been done. It has been found to accelerate recovery in bronchitis, pneumonia, and even carditis, where functional activity, carefully graduated, enhances convalescence. The scope of this form of convalescence has proved to be far more practicable than we imagined a few years ago. Hospitals with enthusiastic rehabilitation departments have demonstrated the value of this form of treatment.

The routine of activity that these men are encouraged to accept is as follows:

On the first day after operation they get out of bed and walk a few steps to a low armchair. There they find they could sit in greater comfort than in bed and that the greater flexion of the hips helps to support the inguinal canal so that they can cough with less strain. They are allowed to sit up as long as they enjoy it. On

the next day they get up for two similar periods, and are told that they may walk to the lavatory if they want to. Not many avail themselves of this permission until the third day. From that time they are told that they may do anything that they can do, and are up the greater part of the day. Many play billiards, help with light ward duties, and walk about the grounds. They are given no specific exercises until the eighth day, when they are transferred to J.W.O. Convalescent Hospital, and begin graduated physical training with a sergeant instructor. An interesting side-light has come from the nursing staff, who are able to predict with a fair degree of accuracy which patients will have post-operative respiratory complications before operation has taken place. They have noted that the anxious, miserable, worried, unhappy patients who are afraid of hurting themselves will get respiratory complications, while the happy active type will succeed in avoiding them. This point has also been noted by Lucas (1944). If it should be thought that this regime is unduly rigorous the details of the recovery of my daughter, who had a simple herniotomy done, may be of interest. She followed this routine exactly, and had been told from the outset that she might do anything that she was able to do so long as it did not hurt. She got out of bed readily after 24 hours and was walking with confidence on the third day. She left hospital on the eighth day and travelled by train across Britain. From that time she was running about with her brothers and swimming from a beach one and a half miles from home. On the fourteenth day she turned six cartwheels in succession without any hesitation or thought of having recently had an operation. She went back to school without any complaint.

It is notoriously difficult to follow up Service cases, but a questionary has been sent out to 200 consecutive cases one year after operation, and reports have been received from 123. Among these there have been 8 recurrences—i.e., 6.5%. Among the remainder, information is given that many of them are serving over-seas, and it may be assumed that recurrences had not occurred among these men—at any rate before they sailed. Of the rest it is fair to assume that those who have a recurrence or are in any way disabled are more likely to answer questions than those who are quite well. Answers have been received from every battlefield where British troops are engaged. It would appear that a routine of early activity has not increased the recurrence rate.

Summary of Conclusions

1. The rate of recurrence of operations for inguinal hernia is higher than is often realized.

2. Early activity is not a factor leading to recurrence.

My thanks are due to the Director-General, E.M.S., for permission to publish this report.

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Medical Memoranda

A Case of Locked Twins

The following case of locked twins appears to be unusual enough to warrant publication.

The patient, a secundipara aged 30, was seen by me several times during her pregnancy for routine antenatal examination. Her last normal menstrual period was from May 24 to 28; 1943, but she had a further period of vaginal bleeding from July 18 to 22 before she consulted me. This made it difficult to estimate the correct date for the expected confinement, but according to the size of the uterus it appeared that she was due to be confined about March 15—i.e., four weeks earlier than the actual labour. At my last consultation on the expected date, March 15, I informed the patient of the possibility of twins, owing to the large size of the abdomen and the difficulty of ascertaining the foetal position.

On April 17 at 3.30 a.m. the waters broke, and at 9.30 a.m. she started getting weak pains. Towards 7 p.m. the midwife made a rectal examination and thought she felt a foot presenting through the fully dilated cervix. I confirmed this finding with a further rectal examination at 7.15 p.m., and, to the right of the foot, felt what I took to be the half-breech. The patient was bearing down strongly with good five-minute pains. On abdominal examination no definite positions could be distinguished, as foetal parts could be felt everywhere, and in the left flank there was an ovoid mass which the midwife insisted was a head, but this was subsequently disproved. One foetal heart was heard in the right flank below the umbilicus, and another in the left flank at the level of the umbilicus. The difference in rate between the two was not enough to be significant. A diagnosis of twins was made, and I anticipated no trouble. However, after about an hour the pains became weaker and less frequent, and there was no apparent progress. The patient showed signs of exhaustion, and at about 9 p.m. I decided to make a vaginal examination to find out what was holding up the progress of labour. I found a leg lying in the vagina, and could feel along the leg as far as the mid-thigh; but, to my surprise, lying to right of the leg was a head covered by a bag of membranes, and it was apparent that the head of the one twin and the half-breech of the other had entered the pelvis together and become locked. What I had taken for the buttock, on rectal examination, was now disclosed as the second head covered by a "bag of waters." The latter bag of membranes, incidentally, was formed by a fold of membrane being caught between the two twins, as we subsequently found only one placenta and chorion.

I sent for the aid of Dr. David Gamsu, and under deep ether anaesthesia he pushed the presenting head up out of the pelvis with his vaginal hand and held it up with his external hand. We thereupon pulled the half-breech of the other twin down and delivered this twin as a breech presentation. The infant was a female weighing 5 lb. 3 oz. and, like its sister, exhibited only slight blue asphyxia. Delivery was complete at about 10.30 p.m., a single placenta being born about 30 minutes after the second foetus, and the post-partum haemorrhage was normal in amount.

The puerperium was normal, and the patient got up on the 10th day, both babies doing very well. The case appears to be interesting because of (*a*) the comparative rarity of locked twins—the usual incidence given being 1 in 90,000 pregnancies; (*b*) the unusual method of locking.

I am indebted to Dr. D. Gamsu for the delivery of a difficult case and his help with these notes.

Johannesburg, S. Africa. B. A. Bradlow, M.B., B.Ch.

Quinsy, complicated by Deep Pharyngeal Thrombosis, Multiple Infarcts of the Lungs, and Myocarditis

Quinsy appears to be a fairly common complaint among Service personnel, but the complications in this case are unusual and should be of interest to readers. I am unable to find a similar case in the literature.

Case Record

On July 15, 1943, a W.A.A.F. was admitted to hospital as a case of diphtheria. On the previous day she was admitted to the R.A.F. sick bay complaining of nausea, vomiting, sore throat, and general malaise; temperature 101°, pulse 84. The throat was inflamed and there was exudate on both tonsils. The temperature rose to 105° despite tepid sponging.

On admission the patient was ill and extremely pale. Examination showed: no oral fetor; right cervical adenitis and right tonsillar gland acutely tender; throat very inflamed, with gross oedema of right tonsil; right anterior faucial pillar pushed well forward; left tonsil much less involved; no membrane; stream of pus down post-pharyngeal wall coming from the right tonsil. The condition was characteristic of quinsy with good drainage. Swab H.S. and K.L.B. negative; Schick test negative. Course of sulphanilamide started. Patient developed a swinging temperature, 102°, 104°, to 97°; trismus. Pulse septicaemic in type.

July 17.—Despite the fact that the throat condition improved, the patient became much worse and developed a fine tremor of the left leg.

July 19.—Pulse septicaemic—very full and bounding. Extremely toxic; rigors. Temperature 104°, but throat condition improved and oedema well reduced. Patient's manner very strange. Resistant to examination. Quinsy still draining. W.B.C., 9,884 per c.mm. On July 20 sulphanilamide was stopped: total 14 g.

July 21.—Condition deteriorated. Rigors; profuse sweats; quinsy almost resolved, but temperature continued to swing—102°, 104°. Tremor of left leg continued. Liver palpable 1/2 in. below costal margin. W.B.C., 29,952. A radiograph of the chest revealed some fluffy densities in the right upper zone; the right diaphragm was raised and flat, and the illumination of the right lower zone was poor. Diagnosis: thrombosis of pharyngeal plexus involving the veins close to the internal jugular vein. Sulphapyridine begun.

July 23.—Blood culture positive for non-haemolytic streptococci. Patient complained of pain in right side of neck. A tender swelling felt in the region of the right jugular vein. W.B.C., 23,000.

July 26.—Large tender mass palpable along right jugular vein just above the level of the tonsillar gland. Palatal and right tonsillar oedema; stream of pus coming from the old quinsy opening. Next day a transfusion of one pint of fresh blood was given. Sulphapyridine was stopped on July 29: total 40 g.

July 30.—Acute left-sided pleurisy. Dyspnoea well marked; very slight haemoptysis. The neck condition improved—not tender; hard knotty mass about 3/4 in. long palpable along the jugular chain. Quinsy dry. W.B.C., 14,040. A course of sulphadiazine started on Aug. 2.

Aug. 3.—Dry unproductive cough with pain in the left chest. Crepitations ++ left lower lobe. Throat tender; some pus again leaking from quinsy. *X* rays showed massive density in the right upper zone laterally and densities in the right middle and lower zones. The appearances were not like a tuberculous lesion and were compatible with infarcts.

Aug. 4.—Sulphadiazine stopped: total 25 g. Sulphapyridine started. E.C.G. showed gross myocarditis. Between Aug. 23 and 30 the patient had three attacks of pleural rub.

Sept. 27.—Mild laryngitis. Streaks of pus on post-pharyngeal wall. Three days later the throat condition cleared up completely.
Oct. 5.—Radiographs of chest showed previous densities completely cleared up. The right diaphragm was still raised and flat, but apart from this there was nothing abnormal.

The patient was discharged on Oct. 15 for three months' rest. The myocarditis was still present, but had improved. The total amount of sulphonamides given was 103 g. over a period of 26 days. The only toxic symptom was vomiting. These drugs were discontinued when the white count fell to 12,000.

Comment

In this case of quinsy, venous thrombosis resulted in suppuration in the deep pharyngeal plexus, which eventually drained back into the pharynx through the original thrombosed vessel. This was demonstrated by the fact that light pressure produced green pus via the superior tonsillar fossa. Further complications resulted in extensive relatively sterile thrombosis throughout almost the whole of the cervical portions of the internal jugular vein.

It is suggested that the rigors resulted from almost sterile pieces of clot and that the ensuing metastases produced sterile pulmonary infarcts.

My thanks are due to Dr. George Hurrell, medical superintendent, City Hospital for Infectious Diseases, Newcastle-upon-Tyne, for interpretation of the films. I am indebted to Dr. J. A. Charles, medical officer of health, Newcastle-upon-Tyne, for permission to publish this case.

R. R. J. R. Clarke, M.B., B.Ch.,
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Walker Gate,
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Purpura Fulminans

The following account of a case of purpura fulminans is thought to be of interest because of the rarity of the condition.

Case Report

The patient, a girl aged 6½, was admitted in a stuporous condition on June 25, 1944, with a diagnosis of acute purpura. Two days previously she had developed purpuric spots, but had felt perfectly well, her only complaint being a slight headache on the night before admission. She had had no recent illness. On the morning of admission her mother had suddenly found her unconscious.

On examination the patient was very restless and almost unconscious. The temperature per rectum was subnormal and the pulse was raised only during bouts of particular restlessness. There were large symmetrical purpuric ecchymoses on the arms and legs and a few on the trunk. A very few minute spots were present in the buccal cavity, which was examined with difficulty owing to a tightly clenched jaw. The pupils were then equal and the retinae showed gross haemorrhages, especially on the left side. There was an internal strabismus. Nothing abnormal was found in the chest, but the heart gave a haemic murmur. The abdominal wall was collapsed and there was guarding in all quarters, but no rigidity. The child resented abdominal palpation, especially over the left upper quadrant. Nothing abnormal was found in the central or peripheral nervous system except a dorsiflexed plantar response. There was no neck rigidity. Lumbar puncture produced a heavily blood-stained fluid at negligible pressure, and in view of this it was decided that blood transfusion would be of no avail. The bleeding time was 8 minutes and the clotting time was normal. The capillary fragility test was positive.

The patient's condition deteriorated throughout the day and finally a generalized spasticity set in. All reflexes were very brisk, though at no time were the abdominal reflexes present. The left pupil was dilated and Cheyne-Stokes breathing began, with occasional laryngeal spasm. The temperature gradually rose to 103° just before death. The pulse was weak and very irregular, and the patient vomited once or twice, producing mucus with a few streaks of blood. She became incontinent of urine. Nepenthe, 5 minims, was given to control restlessness. At 4.15 the next morning she died.

Post-mortem Examination.—The brain seemed large for a child of her size, but it was not congested or oedematous. The ventricles were filled with blood and clot, which had burst through the brain substance in the region of the posterior horn of the left lateral ventricle. The meninges were normal. The heart was normal. The right lung was healthy, but the left was collapsed and engorged with blood. There was free blood in the left thorax. The stomach showed a patch of submucous haemorrhages, through which perforation had occurred. This was considered to be due to post-mortem digestion. The gut revealed a few haemorrhages, and one or two were present in the bladder mucosa. There was slight congestion in the liver and spleen, but apart from this those organs were normal. The kidneys, adrenals, and bone marrow appeared normal. There were no joint effusions. Microscopical examination of blood and cerebrospinal fluid showed one or two lymphocytes per c.cm. in the latter, but no other abnormalities. Death was due to spontaneous cerebral haemorrhage.

I should be grateful to glean any information from others with experience of this condition.

C. R. Oyler, M.R.C.S., L.R.C.P.,
House Physician, Worthing Hospital.

Reviews

LYMPH NODE METASTASES

Lymph Node Metastases. Incidence and Surgical Treatment in Neoplastic Disease. By G. W. Taylor, M.D., F.A.C.S., and Ira Theodore Nathanson, M.S., M.D. With foreword by S. Warren, M.D. (Pp. 498; illustrated. 42s.). London: Oxford University Press.

Metastasis to neighbouring lymph nodes is such a fundamental feature of most forms of malignant disease that one may perhaps question the wisdom of writing a book which concerns itself exclusively with the secondary lymphatic involvement divorced from the primary lesion. The primary principle in the surgical treatment of malignant disease that the growth itself, the secondary (usually lymphatic) extensions, and the intervening tissues should be removed *en masse* whenever possible still remains unchallenged. In situations where this is technically impossible the treatment of the glandular involvement has to be accomplished by a separate operative approach. Here there may be some justification for considering the glandular problem as an entity in isolation from the disease as a whole, though even so we feel that anything which tends to divide the conception of a single disease process into two compartments must be fundamentally unsound.

This criticism of the scope of *Lymph Node Metastases* by Taylor and Nathanson of the Harvard Medical School must of course not be regarded as applying to the actual matter or presentation of the subject, for which we have nothing but praise. A large amount of information has been collected in the book which would otherwise need prolonged search through the literature. Statistical tables compiled from studies of large numbers of cases are numerous and valuable, especially as they include some rather unusual aspects, such as the size of the lymph nodes in relation to metastases, and so on. The uncertainty of palpation as a guide to lymph node involvement is clearly brought out, as is the relation of pathological grading to the incidence of metastasis.

The book is divided into three parts, the first of which deals with general considerations, and gives a review of the normal lymphatic anatomy. Part II is concerned with lymph node metastasis on a regional basis, and Part III with certain of the commoner operative techniques. There are some sixty illustrations of anatomical and surgical details. A valuable volume for the surgeon's reference library.

A BOOK ON ANAESTHESIA

Practical Anaesthetics for Students, Hospital Residents and Practitioners. By J. Ross MacKenzie, M.D., D.A. (Pp. 130; illustrated. 10s. 6d.) London: Baillière, Tindall and Cox. 1944.

According to the preface this book is intended to form a foundation on which medical students, hospital residents, and occasional anaesthetists can build a "practice of anaesthesia." Yet in this book of 130 pages and with this title such readers will find a disproportionately large amount of space devoted to splanchnic anaesthesia, helium therapy, and anaesthesia for thoracic surgery—subjects of little interest to any but the experienced anaesthetist. The novice will search hard for detailed guidance on everyday practice, and it avails him little to find a description of unilateral anaesthesia for pneumonectomy, caudal anaesthesia for childbirth, and splanchnic anaesthesia by the abdominal approach. Those who want to know practical details of how to use the Boyle machine, or pass an endotracheal tube, or give a spinal anaesthetic, will be disappointed at the sketchy descriptions. One searches in vain for answers to questions which casualty anaesthetists (often junior M.O.s) ask so frequently, such as how to deal with a man with a bleeding wound in the mouth or a straightforward sucking wound in the chest. Here and there the author touches on physiological or physical points, but some of his statements are open to question. He says, for example, that the concentration of anaesthetic required for maintenance varies with the weight of the patient; that the dials of a McKesson machine measure the volume of gases flowing; that the Oxford vaporizer delivers warm ether; and that the main function of the expiratory valve of "a Boyle

is to control rebreathing. Dr. Ayre will surely be surprised to learn that an endotracheal tube which is too small for efficient respiration becomes satisfactory when his T-piece is affixed.

It seems that the author forgot the title when he set pen to paper. Before the next edition he must make up his mind whether he really wants to guide the novice or whether the D.A. candidate is the reader he has in view. If the former, then the book must be rewritten; if the latter, it must be factually correct.

SIDELIGHTS ON WAR MEDICINE

Clinics. Volume II. February, 1944, No. 5. Edited by George Morris Piersol, M.D. (Pp. 266. Six volumes a year commencing June of each year. One volume every two months. £4 10s. per year.) London and Philadelphia: J. B. Lippincott Company.

Several interesting discussions are recorded in this volume, which is devoted to war medicine. The subjects are chemotherapy, venereal disease, fatigue, fractures, plastic and reconstructive surgery, war wounds and burns, and gastro-intestinal disorders. If there is nothing startlingly new brought forward in the discussions it is interesting to read the views of men actively engaged in dealing with the problems in the various theatres of war which are now spread over the whole world. With the rapid development of practice some of the questions raised—for example, those relating to the very early use of penicillin—seem almost out of date already; and the most valuable part of the discussion deals with the experience of more or less well-established methods not all of which have stood up to the test of extended trial. Unfortunately a large part of the section on fatigue, especially relating to desert warfare, has had to be cut by the censor; but the remainder, dealing with the nutritional value of American field rations and the advantages of the physical training of operational flying personnel, is highly interesting. The gastro-intestinal section deals with the dysenteries, epidemic jaundice, and peptic ulcers in relation to the neuroses.

On the whole the American experiences seem to have been very much on a par with those of the British Medical Services and will be of interest to everyone concerned with war medicine, which will obviously not end with the cessation of hostilities. Six original contributions are included in the volume: on diagnostic cardio-roentgenography in Army examinees, on a walking cast, on burns, on the management of purpura (a useful review of the subject), on the effect of shock upon intramuscular pressures, and on ochronosis.

Notes on Books

Handbook of the R.N. Sick-Berth Staff (H.M. Stationery Office; 7s. 6d.) is a guide book for the sick-berth attendant both when in training and after he has qualified. It has been evolved from the smaller *Manual of Instruction* (1930) and in some respects is more informative. For one thing it contains more padding, some of which is, however, quite attractive—e.g., a brief history of the sick-berth staff and a page on "the nursing code," which may be said to propound the golden rule from the aspect of the sick-bay man. In other respects, however, it is less comprehensive. The previous manual of instruction contained matter which is omitted from the handbook and now found in another volume, *First Aid in the Royal Navy* (noticed in these columns in 1943). This separation of what the sick-bay man should know into two volumes has given rise to duplication; bandaging, for example, is dealt with in both books. The methods of performing artificial respiration are not mentioned in the handbook, and he is referred for these to the first-aid book, but the treatment of fractured clavicle or fractured ribs, for example, is again dealt with in both books. While there may be something said for a nursing manual apart from a first-aid book, this division and elaboration has its disadvantages in loading the potential male nurse with two volumes instead of one and making his task appear more difficult merely by the amount of the reading matter. Both books, however, are admirable so far as each goes, though classification is not always very happy—e.g., fractures of the skull appear under orthopaedic surgery. The section on anatomy and physiology is worthy of special note as an admirable exposition to the uninitiated. The book is clear, concise, easy to read, and well bound, having in these respects a distinct advantage over its precursor, the manual of 1930.

Mr. MCNEIL LOVE has produced a second edition of his book on *Minor Surgery* (H. K. Lewis; 15s.). In the preface (there is only the one for the new edition) he disarms criticism as to what constitutes minor and what major surgery, but it will be generally agreed that at least the field of so-called minor surgery is well covered in this attractive little handbook. Special chapters are contributed on minor surgical operations, genito-urinary surgery, and fractures and dislocations, by Messrs. R. E. Norrish and A. W. Bone, A. W. Badenoch, and F. P. Fitzgerald respectively, while the chapter on anaesthetics previously written by Donald Blatchley has been revised by H. Woodfield-Davies. Revision has been thorough, and the book can be recommended as a sound guide to residents and others who are called upon to practise minor surgical procedures.

The literature on medical mycology is widely scattered and often difficult to consult. For twenty years and more the *Review of Applied Mycology* has abstracted papers mainly on the systematic aspect, while the *Tropical Diseases Bulletin* and the *Bulletin of Hygiene* have reviewed selected papers from the medical point of view. *An Annotated Bibliography of Medical Mycology, 1943*, issued by the Imperial Mycological Institute, Kew, Surrey (price 5s. post free) lists all papers on the subject which were either published or noted by abstracting journals in 1943. This first experimental issue is edited by Dr. S. P. Wiltshire, Director of the Institute, in collaboration with Dr. Charles Wilcocks and Mr. J. T. Duncan, F.R.C.S.

Preparations and Appliances

MODIFIED SOUTHEY'S TUBE

Dr. PROTHEROE SMITH writes from Redditch:

I have found this modification of a Southey's tube of practical value when tapping oedema of legs resistant to other forms of treatment. It consists of a 17 B.W.G. short-pointed stainless-steel hypodermic needle with a rather long mount and two oval

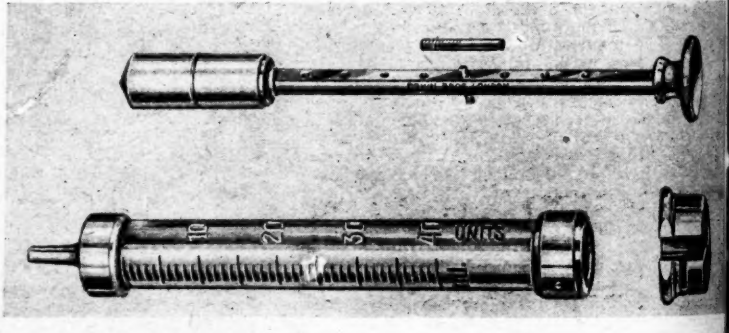
lateral apertures in the 1-inch-long shaft. The needle, inserted in the rubber drainage tube and then sterilized, can be introduced sucutaneously without handling. No trocar is necessary and so no hole is made in the rubber tube and no leakage or air-locks occur. Drainage is quick. A piece of strapping across the junction keeps the needle in place parallel to the skin and harmless to the deeper tissues.

These needles have been made for me and can be obtained from Philip Harris, Ltd., of Birmingham.

ADJUSTABLE INSULIN SYRINGE

Dr. C. T. ANDREWS, F.R.C.P., honorary physician to the Royal Cornwall Infirmary, Truro, writes:

The accompanying illustration shows an insulin syringe which has been made for me by Messrs. Down Bros. It is intended chiefly for diabetics on a single or two equal doses of insulin daily and who are liable to make mistakes in the measurement of their dose—for example, those with failing vision, early



cerebrovascular degeneration, and senile patients who find it impossible to arrange for someone else to give them the injection of insulin.

The illustration explains itself. The stop on the piston is adjustable to 5-unit intervals for ordinary strength insulin and can be easily adjusted by the doctor. When the case is balanced and the dose of insulin determined the patient is then handed the syringe suitably adjusted and instructed to fill it for each dose.

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DRUGS AND THE DOCTOR

One of the most noticeable hiatuses in the White Paper is the failure to consider the bearing of a National Health Service on the supply of drugs and apparatus. It is true that it suggests that pharmacy may be represented on the Central Health Services Council and that the Council may appoint small groups or subcommittees for special purposes. It also indicates that the existing system under National Health Insurance, under which panels of chemists are formed in each area, is likely to continue. Nevertheless, the White Paper does not consider the general problems that will arise if medical care is provided free by the State but at the same time the supply of drugs is left to private enterprise. It is a little difficult to see how doctors are "to encourage a new attitude to health" if the patent medicine industry continues to spend £3 million a year on advertisements suggesting to people that they are ill and that they can only be cured by proprietary remedies.[1] As a result of this campaign, apparently, three out of four people in this country are taking drugs without medical advice and in many cases to the detriment of their health.[2] The use of proprietary remedies has increased since the introduction of National Health Insurance, and sales are much more closely correlated with factors such as the level of wages, the expansion of the popular press, and the development of mass advertising, than with the standard of medical care. The proprietary medicine industry employs a capital estimated at more than £100 million and the annual turnover is thought to reach the figure of £20 million.[3] By and large its effects on personal and social health are harmful, but no Government has ever had the strength or courage to control it. The Pharmacy and Medicines Act, 1941, was merely a cartel agreement between the pharmaceutical profession and the proprietary medicine industry, which divided the retail market for drugs. It was better than many cartel agreements in so far as it was signed publicly in Parliament and not behind closed doors. The net result, however, was that proprietary remedies can now be sold without licence or duty over the counter of any shop in the country.

A second problem that arises is whether a National Health Service is compatible with the advertisement of pharmacopoeial drugs such as soluble barbitone or sulphanilamide under proprietary names. It is true that under the Pharmacy and Medicines Act such drugs cannot be sold by retail unless the label also bears the *B.P.* or *B.P.C.* description, and that a medical prescription is required for their supply to the public if they come within the Poisons Rules, but there is nothing to prevent concentrating publicity on the brand name. As a result of this practice sulphanilamide was being offered in this country under fifty-odd names at the last time of recording. Most of the firms engaged in this trade were buying sulphanilamide from a common source and merely labelling and packing it independently. The object was to make a profit, and not to supply a consumer need, for when a drug is sold under a proprietary name it costs on the average three times as much as when sold under the official name. A third problem arises out of the change in prescribing habits which has occurred during the war. A generation of doctors has grown up which is completely unfamiliar with many of the galenical preparations such as gentian, ipecacuanha, and the vegetable diuretics. Quinine has been banned except for malaria, and even in malaria it has been declared inferior to mepacrine (atebrin) in a recent official American pronouncement.[4] Bismuth salts have been forbidden here for dyspepsia and replaced by magnesium trisilicate and aluminium hydroxide. Sulphonamides and penicillin have ousted other antiseptics and chemotherapeutic agents in local, general, and urinary infections. During the war the Therapeutic Requirements Committee of the Medical Research Council has dealt out rough justice in this field, and permission to import or to manufacture has largely depended on the assessment of drugs in M.R.C. War Memorandum No. 3, "Economy in Drugs in Wartime." What is to happen when controls are relaxed after the war? No medical service is likely to be a success unless it leaves the individual practitioner considerable freedom in prescribing. Is the doctor to become the unsuspecting victim of pressure groups interested in restoring the sales of iodine, bismuth, quinine, or borax? Is his post-box to be crammed with expensive advertising matter, and will he need to set aside a whole morning a week when he will be at home to the travellers? Or is the supply of drugs to depend on a judicial appraisement of the best interests of the consumer as well as the producer?

The difficulty is that no one has a vested interest in sane pharmacotherapeutics, and therefore active steps must be taken by the profession or the community to redress the balance. The individual doctor or patient must be supplied with unbiased information. The Americans manage these things better than we do, and a recent account of the Council on Pharmacy and Chemistry of the American Medical Association deserves serious study in this country.[5] The Council has no legal powers, but most readers will agree with the claim that no single body in modern times has brought about so much change in the practice of therapeutics. The Council derives its influence largely from the important group of medical journals published by the American Medical Association, whose pages are closed to advertisements or names of preparations which are not approved by the Council. Its success has been such that it has become a model for the Council on Physical Therapy, the Council on Foods and Nutrition, and the Council on Dental Therapeutics.

[1] Thompson, D., *Voice of Civilisation*," London, 1943.
[2] Davies, J. N. P., *British Medical Journal*, 1944, **2**, 87.
[3] Chapman, H. E., *The Law Relating to the Marketing and Sale of Medicines*, Bedford, 1942.
[4] Report by Board for the Co-ordination of Malarial Studies, National Research Council, *J. Amer. med. Ass.*, 1944, **125**, 977.
[5] Smith, A. E., Ibid., 1944, **124**, 433.

It consists of 17 members, chiefly professors of medicine and pharmacology in the American medical schools, who work without remuneration but with a whole-time medical secretary. The Council does not initiate clinical trials, and as a general rule the manufacturer must submit the evidence for therapeutic or other claims, which is then reviewed by the members of the Council, together with advertising material and other pertinent data. All the Council's actions, whether of acceptance, rejection, or omission, are published in the *Journal of the American Medical Association*, and later in the book *New and Non-official Remedies* or in the annual reprints of the reports of the Council. The Council's work has been of immense educative value to the members of the American Medical Association, for, however keen an observer the individual clinician may be, he cannot research on all the diseases all the time. It has overcome the kind of difficulty which occurs when new and potentially dangerous drugs, such as thiouracil, are introduced to the profession. We agree with a recent letter in our own columns to the effect that once these drugs are put on the market there can be no arbitrary selection of those doctors who use them.[6] At the same time there is need for a mechanism for supplying information about them and for seeing that they are properly labelled. It is above all in the practice of correct nomenclature that the Council on Pharmacy and Chemistry has done most good, and it must be confessed that the advertising pages of medical journals and the demonstration stands at medical exhibitions in Great Britain compare unfavourably with their American counterparts.

Another step which might be taken to redress the balance against tendentious advertising is to improve the official teaching of pharmacology. In most medical schools, in the words of the Goodenough Committee, inadequate staffing provision has been made for the proper teaching of pharmacology. In improving this staffing it must be remembered that continuous postgraduate education is necessary in a subject which changes so rapidly as therapeutics. The universities must strengthen their pharmacology departments both with a view to research in a field where we have hitherto lagged behind the Germans and the Americans, and with a view to what might be called the adult education of the profession. Few papers are so well received by a medical society as a good presentation of recent advances in therapeutics, and university pharmacologists should be provided with the time and the encouragement for frequent lectures of this kind.

PARTIALLY SIGHTED CHILDREN

It is now accepted as axiomatic that special provision has to be made for the care and education of "problem children." Schools for deaf-mutes and blind children were evolved during the last century, but such schools only touched the fringe of a much wider problem. No provision was made for the handicapped as distinct from the grossly crippled child. In these days of child guidance clinics it is difficult to visualize an educational system without special provision for children suffering from defects which prevent them from benefiting fully from the ordinary school curriculum. Yet that was substantially the position at the beginning of the century, as is well shown by the history of the educational service in London. In 1907 Mr. Bishop Harman recorded at the Second International Congress of School Hygiene that his investigation in schools for blind children in London had shown that many were not blind but had been placed in these schools for high myopia. With the active support of the then Medical Officer (Education), the late Dr. James Kerr, who died three years ago, and of Miss Nettie Adler, a member of the Education Committee of the London County Council, special schools were established for these myopic children. These myope schools aimed not only at the education of the partially sighted child—as distinct from the blind child—but also at preventing the further development of myopia from misuse of the eyes. It is questionable how far this second objective is valid, but there can be no doubt about the validity of the first aim. In fact the London myope schools have since become designated as schools for partially sighted children; names like "preservation of sight classes" and "sight-saving classes" are falling into disuse.

While the pioneer work was being done in London Edmond Redslob of Strasbourg was responsible for similar developments on the Continent, and the movement rapidly spread to the United States. Mrs. Winifred Hathaway has been associated with American developments from their inception, and in her *Education and Health of the Partially Seeing Child*[1] she gives a balanced survey of the whole problem as seen by an educationist. Even now it is a formidable problem both in dimension and in its wealth of conflicting tendencies. She finds that in the United States there are still some 50,000 children who require special educational provision because of defective sight, and this in spite of the fact that there are some 630 special classes in 31 States. Early in the history of this movement two types of special classes appeared. In some places the partially sighted children were segregated so that full attention could be given to their special needs. Elsewhere such children were taught as much as possible in ordinary classes so that they should not lose the advantage of mixing with more normal children and participate in their activities. The first course made the organization of special facilities easier, but the second course is more in keeping with present-day tendencies to study the personality and problems of the child. Mrs. Hathaway's treatise covers fully both these aspects. The type of classroom, the equipment, the lighting, the curriculum—in short what may be called the mechanical aspects—are fully discussed, even to the inclusion of dictaphones and fluorescent lighting. All this is competently done, but what is of special interest to the ophthalmologist is the clear statement of the point of view of the educationist. If the school for the partially sighted child is not to function as a sort of educational waste-paper basket, Mrs. Hathaway's stress on the potentialities of the handicapped child and his need for sympathetic and individual handling will have to be heeded. This is a timely plea, for not to overdrive a

[6] Stanley-Jones, D., *British Medical Journal*, 1944, **2**, 92.

[1] Published for the National Society for the Prevention of Blindness by Columbia University Press ($2.50); London: Oxford University Press (17s.).

handicapped child is hardly synonymous with a charter of rights for such children.

This finely conceived and well-written treatise leaves one conscious of a gap in ophthalmic literature. An authoritative account of the technical requirements and potentialities of the school for the partially sighted as seen by the ophthalmologist has still to come. Perhaps Mr. Bishop Harman might be persuaded to produce the necessary complementary volume to Mrs. Hathaway's study.

OVULATION AND FERTILIZATION

Ovulation in woman usually occurs about 14 ± 1 days before the onset of the ensuing menstrual period. Although it is a spontaneous process, brought about by a hormonic stimulus from the pituitary, its timing is probably subject to considerable variations, and on occasion ovulation may apparently be precipitated by coitus and other forms of local stimulation—the usual mechanism in such animals as the cat and rabbit. In assessing the time of ovulation no fewer than fifteen methods, with major differences in principle, have been employed. When we last commented on this subject[1] methods based on changes in electric potential and the excretion levels of various hormones were in vogue. Since then there has been a return to methods involving careful macroscopic and microscopical study of the ovary, the ova themselves, and the uterus. Recovery of ova by reverse flushing of Fallopian tubes, employed in animals by Allen and Corner some twenty years ago, has been attempted in the human being, and altogether ten free human ova have now been found, studied, and reported on in detail. The latest report on work of this kind comes from W. J. Hamilton, Josephine Barnes, and Gladys H. Dodds,[2] who describe, with beautiful illustrations, two ova, one of which had been recently fertilized. The recovery of ova from the tube has not only in every case so far confirmed the accepted view as to the time of ovulation but has provided information on associated phenomena. Thus it is confirmed that the ovum does not survive longer than 24 hours after ovulation unless it is fertilized. Again, there have long been differences of opinion as to whether maturation of the oocyte occurs before or after it leaves the ovary. Rock and Hertig[3] report the finding of two, out of several hundred ova removed from ovaries, undergoing the first maturation division. Hamilton and others[2] now demonstrate one of their tubal ova at the stage of the second maturation spindle. In fact, of the ten tubal ova so far described this process has been found in three. It would appear, therefore, that the first division occurs while the ovum is still in the ovary, and the second when it is in the tube. But it is undecided whether fertilization is necessary before it undergoes the second maturation division.

Coincident with the study of tubal ova there has been a renewed search for early human embryos in the uterus. Whereas in the past the discovery of such specimens as the Bryce Teacher ovum was accidental and rare, the present-day search has become systematic and deliberate, operations for pathological conditions of the genitalia being timed in relation to ovulation and possible conception. And so Rock and Hertig,[3] working in association with the Department of Embryology in the Carnegie Institution of Washington, were able in 1942 to describe 12 human embryos, varying in age from $7\frac{1}{2}$ to $16\frac{1}{2}$ days. Moreover, many single specimens have been reported in recent years, and Hamilton and others,[2] along with their two tubal ova, describe a uterine pregnancy of 10–11 days' development. The study of such early embryos confirms previously held beliefs based on the changes seen in animal ova, and adds to our knowledge concerning implantation and early development. The time taken for the fertilized ovum to reach the uterus has been generally regarded as being about 7 days. Rock and Hertig[3] now conclude that the time is variable and may be from 5 to 8 days. The occurrence of "implantation haemorrhage," long recognized by the clinician, has been seen in microscopical sections. Moreover, Studdiford[4] found haemorrhagic degeneration in the decidua capsularis in a $26\frac{1}{2}$-day ovum—a process which probably accounts for the haemorrhage sometimes seen in the early weeks of pregnancy, and also possibly explains some cases of early abortion.

It is possible to mention here only a few aspects of the fascinating story of ovum ripening, ovulation, maturation, fertilization, and implantation, but understanding of these phenomena grows apace. So far as direct observation is concerned there remains at least one gap—no one has yet seen a fertilized human ovum undergoing early segmentation or during the morula and free blastocyst stages, when it is still in the tube. But with the continued search of tubal washings there can be little doubt that specimens of 2 to 7 days' development will be found and reported in detail in the not-too-distant future.

OPERATIVE REDUCTION OF GASTRIC SECRETION

There is much evidence that the immediate cause of peptic ulcer is excessive and continuous secretion of gastric juice both during digestion and, more important, during the interdigestive period. A copious secretion at night when the gastric glands are normally quiescent is especially dangerous, since the buffering effect of food is absent. Medical treatment is largely designed to neutralize this acid by diet and alkalis, or in persistent cases by a continuous drip of milk or alkalis into the stomach. The operations of gastro-enterostomy and gastrectomy also act mainly by neutralization. After gastro-enterostomy there is no significant change in the ability of the gastric glands to secrete hydrochloric acid, and after gastrectomy it is rarely much reduced.[5] The results of these operations are on the whole not unsatisfactory, and, however desirable the complete resection of the acid-bearing area might be in theory, it is rarely attempted in practice owing to the technical difficulties. Attempts have, however, been made to reduce the secretion of acid by disturbing the hormonic control of the stomach. The ordinary gastrectomy profoundly modifies the mechanism of gastric secretion by removing the pyloric area which produces the hormone responsible for the chemical secretion; at the same time the surgeon divides branches of the vagus nerve which carry impulses for nervous secretion. The importance of the hormonic activity of the antrum was shown some years ago when Ogilvie[6] devised an operation in which the antrum was preserved, though it was widely separated from the fundus, and much of the acid-secreting mucosa was resected. The results were unfortunate: a high proportion of the patients did badly, and those who were reinvestigated all had a high acid curve. It seems as if the antrum still secretes its hormone, although it is excluded from contact with the acid chyme.

An entirely different principle is proposed by Andrus, Lord, and Stefco.[7] These workers implanted pedicle grafts

[1] *British Medical Journal*, 1938, **1**, 344.
[2] *J. Obstet. Gynaec. Brit. Emp.*, 1943, **50**, 241.
[3] *Amer. J. Obst. Gynec.*, 1942, **44**, 973.
[4] *Amer. J. Obstet. Gynec.*, 1943. **46**, 230.
[5] Heurer, G. J., and Holman, C., *Ann. Surg.*, 1943, **118**, 551.
[6] *Lancet*, 1938, **2**, 295.
[7] *Ann. Surg.*, 1943, **118**, 499.

of the jejunum into the wall of the stomach of dogs and found that thereafter there was a reduction in the amount of acid secreted by the stomach in response to histamine and alcohol. Similar grafts from the duodenum were much less effective, and grafts from the colon or ileum had no action. The effect of the pedicle jejunal grafts was lost in the presence of a gastro-enterostomy or pyloroplasty, and it was not produced by an ordinary gastro-jejunostomy. If the latter was converted into a pecible graft, and the normal continuity of the gastro-intestinal tract re-established, the secretion was promptly altered. Later it was observed that three dogs with pedicle grafts were immune to injections of a histamine–beeswax mixture, which had caused duodenal erosions and ulcerations in nine control animals. Finally, a jejunal pedicle graft was performed on two animals with duodenal erosions. One died within 24 hours of the operation. The other was killed three weeks later and was found post mortem to have a normal duodenum, despite the fact that injections of the histamine–beeswax mixture had been continued till the day it was killed. After these experiments a pedicle jejunal graft was performed on four patients with duodenal ulcer. A symptomatic cure was obtained in every instance, and in one case there was a reduction in the amount of acid secreted in response to histamine five weeks after operation. A physician reviewing these cases would say that in none of them was there an incontrovertible indication for operation, while the surgeon would stress that it may require years to evaluate a new operation. The procedure is obviously a bizarre one, and it is difficult to see its rationale. The results of further observations of the patients will therefore be awaited with interest.

DUST IN STEEL FOUNDRIES

Men employed on some of the processes in steel foundries are exposed to the risk of silicosis, and with the rapid extension of the manufacture of steel castings during the war there has been a substantial increase in the number of cases of this disease among steel-foundry workers. This rise in the incidence induced the Chief Inspector of Factories to call together a committee of employers and workers, a technical adviser, and members of the Factory Inspectorate to advise on preventive measures. Solutions to some parts of the problem remain to be found, but the committee has already reached certain conclusions, which are set out in the report now issued.[1]

Dust arises in many of the operations in steel foundries, but the main dust-producing processes are those connected with the removal of the moulds and cores and the subsequent cleaning and dressing of the castings. The principal methods of combating the risk in these processes are: (1) by substituting other materials for those containing free silica where that can be done; (2) by reducing dust production to a minimum; and (3) by preventing the inhalation of dust. The report discusses in detail the possibility of applying these various methods, and special attention is paid to the first one mentioned. The chief constituent of the foundry moulds is sand, which is a form of free silica, and for the body of the moulds it is at present impossible to recommend any practicable substitute containing no free silica. Some parts of moulds for the larger castings are often made from special moulding compositions which contain free silica. Satisfactory "compo" can be made from calcined aluminous fire-clay instead of from siliceous material; and it is therefore recommended that, as soon as sufficient supplies of the non-siliceous materials become available, no material containing free silica should be used as a constituent of steel-moulding compositions. Silica in a very finely divided state is present in some sands employed for core-making, and experiments are now in progress to determine whether this silica flour can be replaced by non-siliceous material. Separation of parts of the mould is made easier by dusting the joints with parting powders, some of which have a high percentage of silica. It is now practicable, efficient, and economic to employ parting powders which have no free silica; and the use of the former, containing free silica, should therefore be prohibited. The internal surfaces of moulds and cores are often coated with paints containing free silica, so as to prevent fusing of the moulding material to the casting. Experiments confirm that paints containing no free silica can be successfully substituted, and this step is recommended as soon as enough non-siliceous materials are available. Another recommendation is that sand or other substance containing free silica should no longer be used as an abrasive in any blasting apparatus. Normally, the linings of acid steel converters are rich in free silica, so that workers employed in repairing and renewing the linings are exposed to the danger of inhaling dust in a confined space: the possibility of using non-siliceous linings is under consideration.

Besides these substitutions of harmless materials for siliceous ones, other protective measures are advocated. For instance, the existing regulations on "sand-blasting" operations should be tightened up, and a set of precautions is presented which, it is urged, should form the basis of statutory regulations—prevention of escape of dust from blasting apparatus into occupied rooms; exhaust ventilation and the disposal of the collected dust; provision of protective helmets and gauntlets; prohibition of the employment of persons under 18 years of age on blasting operations. It is further recommended that persons engaged in the fettling and dressing of steel castings should be provided with suitable respirators.

If the precepts of this report are put into practice silicosis risks in steel foundries should be much reduced.

[1] *Dust in Steel Foundries.* First report of a committee appointed to consider methods of preventing the production or the inhalation of dust and the possibility of reducing the use of materials containing free silica in steel foundries. H.M. Stationery Office. (6d.)

PLANS FOR CANCER SERVICES

The annual report for 1943 of the Christie Hospital and Holt Radium Institute, Manchester, records a remarkable increase in the number of new patients, which has almost doubled since 1938. This organization has built up an efficient cancer service covering a large and thickly populated area; and other hospitals and authorities, when formulating plans and schemes, are increasingly availing themselves of its accumulated experience. Thus the Director of the Holt Radium Institute has visited Sydney at the invitation of the New South Wales Government to advise on the planning and organization of a Cancer Institute for the State. Other Australian States extended similar invitations. The new plans in New South Wales and Victoria would provide for the building of single institutes in Sydney and Melbourne, with ample clinical accommodation, departments for radium and *x*-ray treatment, and extensive facilities for research. In Queensland, where the geographical position of the capital is less central and the population is smaller, the provision of a special wing at the Brisbane General Hospital is contemplated. In view of the vast area of Australia a clinic service based on air transport will be a post-war necessity. Small special skin treatment centres will also be required, for cancer of the skin, especially in the Northern regions of Australia, is far more prevalent than it is in England.

PREVENTIVE MEDICINE IN THE AIR FORCE

AIR MARSHAL WHITTINGHAM'S ADDRESS

The president (Sir Stanley Woodwark) and the council of the Royal Institute of Public Health and Hygiene held a reception on September 21, the guests including representatives of the medical and public health services of the Allies and other nations and of the Dominions and Colonies. Air Marshal Sir Harold E. Whittingham, D.G., R.A.F., M.S., gave an address, which was illustrated, on aviation's contribution to preventive medicine. It embraced a far wider range than his paper given before the Medical Society of London earlier in the year (*Journal*, March 11, p. 369). Outside the Institute's building in Portland Place a mobile ophthalmological unit and a mobile dental unit as used in the Royal Air Force were available for inspection.

Sir Harold Whittingham described the work done on nutrition in relation to flying aptitude. In 1941 a special physician was employed for the detection of states of pre-malnutrition, and there were biochemists to assay materials and determine in what respect food was defective. Thus faulty diets had been very quickly rectified. It was particularly important to see that people engaged in flying did not suffer from night blindness, and a useful lead was obtained from experience in the siege of Malta, when those suffering from night visual defects recovered on being given oranges. There was also a certain amount of evidence that deprivation of vitamin B was connected with fatigue. If any group of men—not single individuals—was found with a high incidence of vascularization of the cornea it could be said that the diet was deficient in some respect, but beyond that he did not think it possible to go.

He went on to describe the precautions taken against malaria. In mosquito-infested parts screening was carried out, not only of dormitories but of ablution rooms, and this had proved well worth while. He pointed out what a dangerous vehicle the aeroplane might be, in view of the rapidity of travel from one country to another, in spreading various severe infections, including those with the shortest incubation periods. Effective measures were taken for disinfesting aeroplanes by spraying with insecticides.

Predisposition to Air-sickness

Turning to air-sickness, Sir Harold Whittingham said that about 7% of those who suffered regularly had a definite neurosis, but in general the psychological make-up of the individual played no great part. Air-sickness he thought was due mainly to hypersensitivity and over-stimulation of the utricle by variations of pressure at right angle to its floor. Air-sickness on the part of the navigator had been diminished by the tilting of the bench at which he worked, so that he was looking straight forward and not down. During a first flight about 17% of people would be air-sick or very near it; on a second flight only 4%, and after two flights about 0.5%.

Discussing accident proneness he said that this was due most frequently to temperament: unfortunately only those most seriously predisposed (3%) could be detected by psychiatric interview. However, about 20% of aviation candidates were accident prone because they were heavy of hand and foot: such types could be detected by a sensori-motor test and so eliminated. Others were prone because of visual defects, such as ocular muscle imbalance. Notwithstanding instrumental flying, night vision remained important to the aviator, because he had to take off and to make his final landing by vision, and avoid "taxi-ing" accidents and collisions over the target. The night-vision standard had been lowered as much as practicable because, after all, it was only one attribute of night-flying.

Another study had been that of "crash" positions. The idea was that everyone concerned should know his "crash" position; Service members were trained in this respect, and posters put up for the information of others. On the subject of burns he emphasized the protective effect of clothing. Even a small amount of clothing, if not soaked with petrol, would protect the skin from a flash burn. Gloves should be worn, or rather gauntlets protecting the wrist, and on the risk of a crash the face should be covered.

Finally, he described the "Mae West" jacket and how it would save from drowning even unconscious individuals, and various other items of protective clothing. Frost-bite had ceased to be a problem in the R.A.F. during the last two years. Only 0.05% of the people concerned got frost-bite even under the worst conditions. Some interesting experiments on "black-out" and oxygen requirements had been carried out in a flying laboratory. At as low an altitude as 4,000 ft., if no oxygen was taken, night visual acuity was reduced by 5%; at 6,000 ft. by 10%, and at 8,000 ft. by 15%. He added that all this work was carried out by a team of doctors, physiologists, chemists, physicists, textile experts, and others. It was also an Allied enterprise, people from the Allied and Dominion Services having co-operated most heartily, and he ended with a tribute to some medical officers who had lost their lives in their zeal for experiment.

Nova et Vetera

JOHN DALTON, 1766–1844

Every medical student has heard the name of John Dalton; indeed all educated persons know it as that of the founder of a rational atomic doctrine based on measurements, and most medical men associate the name with colour blindness. Few, however, know what kind of man the bearer of the name was, and many will read with pleasure Dr. E. M. Brockbank's pleasant biography[1] and pay the biographer a compliment not many biographers earn—viz., a wish that the book had been longer.

John Dalton (1766–1844), the son of a Cumberland weaver, owed nothing to academic instruction; his father taught him the elements of mathematics, and he was also taught by a Mr. Elihu Robinson; but, as he began to earn his living by teaching younger children at the age of 12 and at 15 became a regular school teacher, we may fairly class him as self-educated in the strict sense of the word. In 1785 he joined his elder brother in school teaching in Kendal, where he remained until 1792, when he became a teacher of mathematics in the Manchester New College—the ancestor of Manchester College, Oxford. One wonders—it is only a matter of speculation—whether during his residence in Kendal Dalton made the acquaintance of another self-taught mathematician, John Dawson of Gardale (1734–1820), the Sedbergh doctor who took private pupils and numbered among these eight who became senior wranglers. Although Dalton remained in straitened circumstances most of his life, his genius was recognized fairly soon, and he was elected a corresponding member of the French Academy of Sciences in 1816; 14 years later, on the death of Sir Humphry Davy, he was chosen one of the eight foreign associates, and when his name was announced by the president all the members rose—a compliment not paid either to Napoleon or to Lord Brougham.

That science is measurement is, perhaps, an epigram rather than a satisfactory definition; but it is certainly true that interest in precise measurement was a primary quality of Dalton's mind; it can be seen in his early meteorological studies and, of course, in his classic researches. It is worth noting that Joule was once a pupil of Dalton.

As a human being Dalton was something of a character, cheerful and loving a joke amongst intimate friends but apt to be silent in a large company and by no means a brilliant lecturer. Dr. Brockbank tells us that in a book on English grammar Dalton published in 1801 gender as expressed by a change of termination is illustrated by: "prince, princess; poet, poetess; executor, executrix; phenomenon, phenomena, etc." One would like to think this was a little joke. We have read a story somewhere that Dalton, who was a Quaker, flatly refused to wear court dress when presented to the king, but consented to wear his D.C.L. gown, *not knowing it was scarlet*. The italicized words we suspect to be a facetious addition, for

1 *John Dalton: Some Unpublished Letters of Personal and Scientific Interest, with Additional Information about his Colour-Vision and Atomic Theories.* Manchester: University Press. (7s. 6d. cloth; 7s. boards.)

Dalton would certainly have known that the colour was called scarlet by other people. Dalton's reply to the king's question: "Ah! Dr. Dalton, how are you getting on at Manchester?" was: "Well, I don't know: just middlin'." Dr. Brockbank prints some hitherto unpublished letters; they are without any literary airs and graces, but the composition of a thoroughly clear-headed man and say exactly what he meant to say.

ROBERT BRIDGES, 1844–1930

Robert Bridges, physician and Poet Laureate, was born on Oct. 23, 1844. There have been many medical poets, but though they have been good doctors not many of them have been great poets. Bridges was both, and it was fitting for the History of Medicine Section of the Royal Society of Medicine to commemorate the centenary of his birth, when the outgoing president, Sir Walter Langdon-Brown, gave the address. From Eton and Oxford Bridges went to St. Bartholomew's Hospital, where he became house-physician to Dr. Patrick Black and afterwards casualty physician. In the latter capacity he wrote in the Hospital Reports for 1878 a powerful indictment of the running of the casualty department. This ensured that he was never given another post at Bart's, but also led to reforms, albeit slowly. But he was elected assistant physician to Great Ormond Street Hospital and the Great Northern Hospital. In 1881 he had pneumonia and emphysema, which led to his retirement from medical practice. He had always intended to devote himself to literature, but was convinced that he would be a better poet if he practised medicine in order to be brought into close contact with human life. He evidently wished his poetry to expound the philosophy he acquired from natural science in general and from medicine in particular.

In early life Robert Bridges was closely associated with his kinsman Digby Dolben, a poet of much promise who was drowned when only 19, and at Oxford with Gerard Manley Hopkins. He was responsible for the posthumous publication poems of them both. It is a curious association since their approach to poetry was emotional and religious, while his was intellectual. He was fascinated by the sonorous rhythms of the great poets, but intellectually he was a Platonist. In 1900 he was elected a Fellow of the Royal College of Physicians, and in 1913 became, rather unexpectedly, Poet Laureate, thus restoring prestige to an office which had suffered from the apparently cynical appointment of Alfred Austin. Apart from poetry Bridges did much for the encouragement of pure English, and favoured a simplified spelling. But his enduring monument will be *The Testament of Beauty*, published on his 85th birthday, which summarizes his philosophy of life. That a man of his age should have written such a poem is in itself remarkable enough, but that he should have assimilated recent work on astronomy, archaeology, physiology, and psychology, and have welded them into new forms of beauty is indeed amazing.

Sir Henry Newbolt described him as one of the most remarkable figures of his age, who appeared distinguished in any company, not only because he was strikingly handsome but because his extraordinary charm lay in his transparent sincerity. There was always visible the strength of a towering and many-sided nature, at once aristocratic and unconventional, virile and affectionate.

The question of preparing for expansion in training for pharmacy after the war was dealt with by the Dean of the College of the Pharmaceutical Society, Prof. H. Berry, in reviewing the work of the past year at the opening of the College's 103rd session on Oct. 4. He said that pharmacy was continually expanding and diverging from the old channels of retail and hospital practice in order to cope with developments in medical practice. This expansion must be reflected in the training of the student if pharmacy was to keep pace and maintain its place. Pharmaceutical chemistry was developing rapidly as the study proceeded of the relation between chemical structure and therapeutic activity, the standardization and assay of medicinal substances, and the introduction of new synthetic medicinal substances. It was hoped that in the post-war era there would be a great expansion of the attention given in this country to the production of new medicinal chemicals. Firms were already finding graduates in pharmacy of greater use in this field of research than those holding a pure chemistry degree.

Correspondence

"Dissident Doctors"

Sir,—Returning from a lengthy meeting of the committee entrusted by our Association with the task of running the *B.M.J.*, I read in its pages, with some astonishment, that "it is more than disquieting that, at a time when the shortage of doctors is acute, a number of them are prepared to spend time, money, and paper in fomenting political activity and indeed in directing it." I had believed that in giving my time, spending a little of my money, reading many pages of documents, and listening to many points of view on the Journal Committee, I was genuinely helping the political activities of the British Medical Association. I have rarely failed to answer the call of that Association to play my part in its work, and I did not expect to be thus criticized in the official *Journal* for so arranging my ordinary work that it leaves some time for duties within my professional association. Surely it is the duty of all of us to play our part in the management of the affairs of our country and of our profession—in short, to take part in all political activities that concern our way of life.

Let us, however, get one or two things stated accurately and the position clearly defined. The action of Dr. Sam Smith is surely the ordinary activity of any person or group who wish to influence opinion. I have in my possession papers sent out by the B.M.A. suggesting precisely the same sort of activity as those suggested by Dr. Smith. Is not that one of the functions of the Public Relations Committee? If Dr. Smith stood alone instead of being backed by many B.M.A. members his action would still be of a type carried on by the B.M.A. itself. Secondly, Dr. Smith may be fortunate enough to "belong to that small minority of doctors who find themselves within the fold of the Socialist Medical Association," but he is certainly not "one of the drivers of the S.M.A. machine," nor is the work of which you complain part of the S.M.A. programme. Dr. Smith's group is composed entirely of members of the B.M.A., and is an attempt to crystallize that 60 or 70% of opinion within the B.M.A. which is all too unvocal but which voted in the Questionary in favour of Health Centres organized as part of a complete service for 100% of the people.

Of more importance, however, is your reiteration in your annotation of the very attitude towards the M.P.A. of which Dr. Smith complains. The M.P.A. has declared its intention to capture the B.M.A., and has had some notable victories in certain reactionary Divisions. It must be attacked if the B.M.A. is to continue its work; for here we must distinguish between the legitimate work of the S.M.A., which exists to spread a knowledge of Socialism within the profession, and an organization which seeks to destroy our chief professional society. The S.M.A. and all progressive doctors will continue to attack the M.P.A., and would the more readily back the Council in so doing if the Council does not seek, as does your annotation, to excuse and justify it as a reaction to the work of the S.M.A. The crux of the question is whether we stand for true democracy or can support even in the smallest degree the curious mixture of Fascism and individualism (with more than a dash of anti-Semitism) which passes for a policy with the M.P.A.

Lastly, why the anxiety about Gordon Malet? Was not his attack on the M.P.A. one you should have welcomed? And are not your own leaders unsigned?—I am, etc.,

D. Stark Murray,
Richmond, Surrey. Chairman, E.C., Socialist Medical Association.

*** We have criticized Dr. Samuel Smith—we did not know there was a group until informed by Dr. Stark Murray in the above letter—for using an "individualistic" machine of his own instead of the democratic machinery of the B.M.A. through its Divisions and Branches, to one of which Dr. Smith presumably belongs. We criticized the action of the Socialist Medical Association because it "exists to spread a knowledge of Socialism in the profession." Other small self-appointed groups of "political" doctors will soon sprout up to spread their political doctrines if this example

of misplaced enthusiasm is followed; and we shall see the existence of the "Conservative Medical Association," the "Liberal Medical Association," the "National Liberal Medical Association," the "Common Wealth Medical Association," the "I.L.P. Medical Association," and so on. There are political organizations in plenty to give medical men what political information they need, and to offer them scope for political activity. Dr. Murray obscures the issue by confusing medical politics with politics in the familiar use of that term. Finally, we should like to make it quite clear that no attack on Socialism is intended.—Ed., *B.M.J.*

Sir,—I shall be grateful for an opportunity to reply to your annotation concerning me. The errors of fact and surmise in it I shall leave to be dealt with by others better qualified than I am. I wish only to draw attention to a fundamental issue—the right to hold my own views on the National Health Service and to put these views to whomsoever will listen, even as you, Sir, enjoy that privilege.

I am shortly entering H.M. Forces, and, feeling as strongly as I do, have tried, with, I hope, a certain measure of success, to persuade others who think as I do to become articulate on the subject. There are many doctors to my knowledge who for a number of reasons have not expressed themselves other than by means of the Questionary. That I am not in a "*small* minority" is shown by the figures of the Questionary.

It would appear that a "dissident" doctor is, according to *your* interpretation, one who opposes the views of the Council of the B.M.A. If that is correct, then I plead guilty to being one of a number whose ranks I believe will increase. If and when there is a clear-cut majority vote by the rank and file of the profession for a particular issue I shall accept that decision, but reserve the right, as in all democratic organizations, to attempt to reverse it by means of legitimate persuasion and not by coercion or hysterical outbursts.—I am, etc.,

London, E.9. S. Smith.

Antenatal Health and the Unborn Child

Sir,—In your report on schemes for medical and social research (Sept. 30, p. 444) child welfare is conspicuously prominent in "Social Adaptation" and "Infant Dietetics." This is all to the good, as the future of the race depends on the rising generation, and a sound foundation is essential for any enduring progress.

It seems to me that much more might be done by research into antenatal conditions which determine the perfection of the newborn child and minimize the risks of labour to the mother so that she may be at her best immediately to undertake the care of her baby. Antenatal clinics are doing a great service by giving advice and providing vitamins to expectant mothers, but much more might be done if the methods, as to statistics, of the Mellanbys with mice were observed: a close follow-up of results in recording the effects of diet and treatment on mother and child; as to deformities, physical and mental; lactation; maternal morbidity and mortality; and the effects of illnesses, especially sepsis, during the early weeks of gestation when deformities are determined.

During the past eighteen years it has been my practice to see every expectant mother each week from the time of booking, and to maintain her health at the optimum by advising her on diet, rest exercise, external and internal cleanliness, and especially by actinotherapy from the earliest possible date. The most obvious and immediate effect of this course is the improvement in the appearance of the woman. Her skin becomes darker, of a better colour, and shines like silk. There is a better tone in her tissues generally. Her posture is more erect and she evidently enjoys life.

Sickness is either cured or much relieved and does not last so long, though there are exceptions. Good muscle tone of the uterus shortens labour and reduces loss of blood to a minimum. The teeth are preserved as the improvement of calcium and phosphorus metabolism by photosynthesis protects the skeletal calcium reservoir from depletion. Raising the immunity from infection protects her from sepsis, and one rarely sees even a slight rise of temperature and wounds rapidly heal. After parturition most of these women feel that they could get out of bed and resume a normal life. This is only as it should be, but, of course, is not allowed in modern practice. A striking feature is early lactation, even in those who could not feed previous babies.

As a general practitioner in an industrial town material and time have been very limited, but there has been an advantage in having cases for a long time under individual attention. The development of the child after a good start has been most interesting. I am convinced that results have been better than they would otherwise have been. Ossification is well advanced, cranial bones firm, and fontanelles closing well; dentition normal and muscle tone good. Walking sometimes starts earlier than expected, and in one case was well established at 8½ months.

What is most striking is the healthy state of the mental faculties during the past few years; each child has either gained a scholarship to the Bolton School or passed the entrance examination. I have pressed the use of actinotherapy where there is mental defect in the family history of either parent, and results so far have justified this course.

The Government is making great plans on new housing schemes and preparing to spend freely on these, but the bodies we live in have the first claim on our attention, and the future citizen is of more importance than the shell he inhabits from time to time and which is not indispensable. Educational reforms are of less importance than good material.—I am, etc.,

Bolton. Wm. Harvey Bennett.

Wound Fractures in Plaster-of-Paris

Sir,—I would like to support Prof. Willan in what he says about wound fractures in plaster-of-Paris. At the Royal Victoria Infirmary, Newcastle-upon-Tyne, we have had a large number of war casualties with compound fractures of limb bones enclosed in plaster-of-Paris. The bulk of these cases arrived in splendid condition thanks to the magnificent surgical treatment they have previously received, aided by the sulphonamides or penicillin. But a small minority are not in this category. They arrived in a rather poor toxic condition, running a temperature, and with the plaster stained and odorous. Some of these we know must have the plaster removed and the wound inspected, but in between are cases where one is really in doubt whether to interfere or not. *X* rays perhaps show the bones to be in good position, and one is afraid of spoiling this, although one is unhappy about the condition of the wound or wounds. This is the sort of case where Prof. Willan's suggestion would be most useful if carried out. The "blister" or "protuberance" would show one the site of the wound and the plaster over it can be easily removed, the wound inspected, and any necessary local treatment carried out without disturbing the position of the fracture. Of course one knows that in many cases the site and position of the fractured bones are drawn on the plaster, and this method is most useful, but it does not, perhaps, show the site of the wound or wounds. I think that Prof. Willan's suggestion is a very good one, and if carried out will be most helpful.—I am, etc.,

Newcastle-upon-Tyne. J. Hamilton Barclay.

Early Cancer: Difficulties of Hospital Admission

Sir,—Mr. Wilfrid Adams in his letter (Sept. 30, p. 450) rightly points out that the alert general practitioner is more likely to be responsible for the early diagnosis of cancer than is the institution of numerous cancer clinics. A further point I should like to make regarding the prognosis of cancer is that, having diagnosed it, the general practitioner has great difficulty in obtaining early treatment for his cases. The patient is seen at a local hospital and put on a waiting list for admission. According to the locality, he or she may be kept waiting a matter of weeks or even months. Meanwhile the disease progresses and may become inoperable or beyond the aid of radium.

Until cases of suspected or proved cancer are treated as urgent admissions for the purpose of investigation and treatment, the death rate and suffering from this disease will continue at its present high level.—I am, etc.,

Scarborough. Anne M. Roxburgh.

London Medicine

Sir,—Dr. Rowland Hill's letter (Oct. 7, p. 479) must in general command such a measure of approval that his particular somewhat critical reference to the Institute of Child Health cannot be allowed to pass without comment. He is clearly under a misapprehension as to the prospective scope of the institute.

The conception in the minds of its originators has always been just as comprehensive as Dr. Rowland Hill suggests it should be, even to the full title of "The London University Institute of Child Health." It is true that the plan for such an institute emanated from the Hospital for Sick Children, Great Ormond Street, and that this hospital has been most active in furthering it. We are proud of the fact. But the design has always been on the broadest lines, aiming at co-operation between all concerned with the health and well-being of children.

A present collaboration between the University of London, the L.C.C., the Postgraduate Medical School, and the Hospital for Sick Children would seem to assure an adequate breadth of vision, which certainly aims at embracing in the future every paediatric activity in and around London.

All would agree with Dr. Rowland Hill that this great project must be made truly worthy of the capital city. I hope he may be convinced that the foundations are being well and truly laid, and that he may come to share the confidence in the builders, which has induced the Nuffield Trustees to subscribe £100,000 to the work.—I am, etc.,

Hospital for Sick Children, Great Ormond Street, W.C.I. T. Twistington Higgins.

Intravenous Anaesthesia

Sir,—Major Maidlow (Sept. 30, p. 432) has put forward several criticisms of our apparatus for continuous intravenous anaesthesia which we described in the *Journal* of Dec. 25, 1943 (p. 813). We should be grateful for the opportunity to answer his criticisms. We believe that his remarks can only be based on armchair critical perusal of our paper, as the majority of the faults he has to find do not occur in practice.

There is no *flow* of oxygen except to the patient via the flowmeter. There is merely back-pressure in the saline bottle caused by constricting the flow between the "Y" piece and flowmeter; therefore Major Maidlow's dogmatic and terse dismissal of this method with the words "besides being wasteful" is quite unjustified. If the rubber bung of the saline container does not fit well, it can happen that the pressure in the bottle is enough to blow the cork out. A well-fitting cork or a little intelligent use of adhesive strapping will obviate this. In practice there is no need to turn off the oxygen, nor any need to fit an automatic mercury manometer or blow-off valve, and therefore the complications or disadvantages which spring to Major Maidlow's mind do not exist and consequently do not need obviating.

Let us answer his enumerated list of disadvantages one by one:

1. The tubing, punctured at each injection, can be kept sterile by covering with a swab soaked in antiseptic; in any case the delay caused by wiping a piece of tubing with a swab is not worth discussing.

2. While we entirely agree with Major Maidlow on the prime importance of maintaining a clear airway, in the vast majority of cases some position of the patient's head can be found which will ensure a clear airway without the constant holding of the jaw by the anaesthetist. In his gravity-drip days, how did Major Maidlow drag his heavy metal stand to and fro without taking his hand from the patient's jaw and his attention from the patient's general condition?

3. There is usually a vein available in a limb not in the vicinity of the operation, surgeon, or assistant, and towels may be arranged so that the anaesthetist may have access without intruding on the operative field.

4. The first question in this section surely does not need an answer. The second shows the gnat-straining qualities of Major Maidlow's aseptic technique. He cheerfully swallows his camel regularly in his own method by allowing a gallipot containing pentothal for intravenous injection to be open to the air.

5. We agree with this criticism, especially with wartime rubber tubing.

In return may we offer a few criticisms of Major Maidlow's method:

1. The aspiration indicator Major Maidlow admits is most useful, but he makes a rule to avoid using it.

2. A three-way tap we tried and abandoned because: (*a*) it tends to leak from the tap and each of the four rubber–metal joints; (*b*) to avoid dead space of saline or pentothal it must be close to the needle, and there it is heavy and tends to drag on the needle and dislodge it.

3. Pentothal in an open gallipot, besides being liable to dust contamination and airborne infection, dissociates much more rapidly than pentothal kept free from air in a syringe.

4. Unless the pressure in his bottle is unduly high there is no more reason why the saline level in the drip bulb should rise too high using positive pressure than when using gravity. However, he admits the possibility but sees no use for the employment of side-tube and clip—which, of course, give perfect control over the level under all circumstances.

5. Why bother to insert an air filter between bellows and bottle while the pentothal is left in an open gallipot?

6. Why wait 15 minutes to obtain the benefit of supplementary gas and oxygen? The patient can be "settled" much quicker with far less pentothal if supplementary gas is used immediately after induction.

In conclusion we should like to point out that all these differences of opinion are on minor points of technique, in which there must always be a considerable degree of personal preference. Generally speaking, we are in absolute accord with Major Maidlow on the indications and contraindications of continuous intravenous anaesthesia, and we should especially like to endorse his statement that for prolonged laparotomies the anaesthetic of choice is some form of regional analgesia combined with light pentothal, or pentothal, gas, and oxygen anaesthesia.—We are, etc.,

Middlesex Hospital, W.1. F. W. Roberts. B. A. Sellick.

Pentothal in the Shocked Case: A Warning

Sir,—I have recently returned from North Africa and Italy, where for the past year I was anaesthetic specialist to one of the Services. It was my lot during that time to see a number of anaesthetics given by medical officers who were not trained anaesthetists, and two things struck me very forcibly when observing their technique. The first was that in the giving of inhalation anaesthetics many of these officers showed little indication of recognizing the importance of that first principle—the maintenance of a clear airway—and were quite content in many cases to let the patient continue with some degree of obstruction.

The second was to my mind of much greater importance and was the thing which prompts me to write this letter. It was the failure to appreciate the appropriate dosage of pentothal in cases suffering from shock. It seemed to be their attitude that "a shocked case needs a *little* less pentothal than a 'cold' case," with the result that if it had not been for the presence of an experienced anaesthetist overdosage and grave risk to the patient might have occurred. No criticism of these medical officers is implied, but it is suggested that teachers should stress that while technically pentothal is the easiest of all anaesthetics to administer, it is also "fatally" easy to administer an overdose, and what might be considered a normal dose for the robust person might well be fatal to the same individual shocked or exsanguinated.—I am, etc.,

Howard Bruce Wilson.

Urethral Lesions in Enuresis

Sir,—The interesting article by Lieut.-Col. Backus and Capt. Mansell on enuresis in the Army (Oct. 7, p. 462) refers to me as finding that congential stricture in children is a chief causal factor of enuresis (p. 465). This, I am afraid, is a misrepresentation of what I have said on this subject. I certainly hold the opinion that urethral examination reveals a high percentage of urethral abnormalities, which are mostly chronic inflammatory in origin, and that laboratory reports on the urine generally fail to give any indication that such

is the case. I notice that in this report there is no reference to urethroscopic findings; these are important in relation to treatment. Nor is there any indication that observations were made with regard to residual urine in the bladder; the presence of the latter is important for the same reason. I have had more than one patient under my care who was discharged from one of the Services because of enuresis, and in whom posterior urethral lesions were found, the treatment of which caused a cessation of the enuresis.—I am, etc.,

London, W.1. H. P. Winsbury-White.

Oestrogens and Cancer

Sir,—I read with interest the article on synthetic oestrogens and advanced cancer (Sept. 23, p. 393), and I note the authors' statement that the effect of giving stilboestrol provides an incentive to further investigation. The administration of stilboestrol is scientifically correct, but in the study of the genesis of cancer there has been a failure so far to give place to other important physiological considerations.

I am convinced that the cause of malignant change is inherent in the organism, and that it is an error in the metabolism of two interdependent bodies—fats and sugar. It has been truly stated that the fats are the cement which holds together the organized matter of the protoplasm, and in the pre-cancerous condition the cells and their protective oily envelopes are starved of fat and so rendered more sensitive to bio-chemical agents. At the same time the faulty fatty metabolic error results in an increase of non-saturated fatty acids, which combine with the alkalis of the tissues to form saponins. Incidentally, B. Moore and others have observed an increase in the alkalinity of the blood and tissues in cancer. That saponins are irritating and can cause increased mitosis has been proved by experiments which readers must study for themselves.

In pre-cancerous states there is also an excess of sugar in the system, for I have frequently found recurring glycosuria in patients some years before the growth appeared. This is not likely due to lack of insulin, which, after all, does not burn sugar but only prepares it for combustion. Rather is it due to: (1) over-activity of the anterior pituitary, and (2) imperfect preparation of the fats. Sugar and fats cannot burn one without the other, and both must be prepared for the burning by their respective enzymes.

I have an idea that if we could correct the faulty metabolism of these two substances the result of the stilboestrol treatment would be more satisfactory. And in the pancreas we have the necessary enzymes staring us in the face: they are the lipolytic enzyme and insulin. Why, then, not use them? They could be introduced by intramuscular injection of pancreatic extract (whole gland). I am no chemist and therefore cannot say whether in the course of preparation of the extract the activity of the more important ferment—the lipolytic—would be destroyed; if so, the extract would be useless. It all sounds very simple and easy, just as the solution of the cancer problem will appear to be. This will not come until we pay more attention to physiological principles. Indeed,

> "Life is no crazy pathway. Every bit
> Is planned beyond our human ken to fit."

—I am, etc.,

Wigan. J. Thomson Shirlaw.

Familial Leukaemia

Sir,—Dr. Meikle's report (Oct. 7, p. 468) of two varieties of leukaemia in one family is extremely interesting, but familial incidence is not quite as rare as he suggests. Thus, Dameshek, Savitz, and Arbor (1929) have recorded chronic lymphatic leukaemia in twin brothers aged 56; and Jelke (1939) gives details of acute lymphatic leukaemia in identical twins. And Decastello (1939) reported six cases of chronic lymphatic leukaemia in two generations of one family.

Such familial incidence is a good deal commoner in lymphatic leukaemia than in the myeloid form (Ardnashnikov, 1937); but, so far as I am aware, there is no previous report of two varieties of leukaemia in the same family. Even so, it is just possible that Dr. Meikle's cases were both of the Naegeli type of monocytic leukaemia—that is to say, that in Case 1 there was a monocytic increase in a primarily myeloid leukaemia, while Case 2 was continuously myeloid.

It is interesting to recall that Richter and MacDowell (1935) have shown definite influences of genetic factors in experimentally induced leukaemia in mice.—I am, etc.,

London, W.1. A. Piney.

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Richter, M. N., and MacDowell, E. C. (1935). *Physiol. Rev.*, **15**, 509.

Sir,—I have read with interest Dr. Meikle's article (Oct. 7, p. 468). There are, Dr. Meikle's case included, 28 incontrovertible cases of familial leukaemia reported in the literature. Last year I had the opportunity of diagnosing two cases of monocytic leukaemia in one family. A full account of them and a review of the literature will be published elsewhere. The occurrence of two cases of monocytic leukaemia in the same family has, to my knowledge, never been recorded before. Familial cases of leukaemia are probably more common than is usually supposed. To establish this more extensive genetic studies and systematically repeated blood examinations of all the relatives of leukaemic patients in different generations will be necessary—I am, etc.,

London, E.17. B. Juhn.

Words and Clear Thinking

Sir,—Clear thinking is largely determined by clear expression. Those who deliberately misuse words are enemies to science. Pre-eminent among these miscreants are the teachers of medicine who persist in the use of the phrase "hyperglycaemic coma." Their pupils are led: (1) to assume that sugar is a toxic substance; (2) to inform examiners that diabetic coma is due to hyperglycaemia; (3) to give insulin for this state without a corresponding quantity of sugar.

I wish to bring these facts to their notice, and to ask all such teachers to expunge the noxious phrase from their minds, their books, and their tongues.—I am, etc.,

London, W.1. Geoffrey Bourne, M.D.

Functional Hypoglycaemia

Sir,—Dr. Wilfrid Oakley (Oct. 7, p. 479) has seen fit to pass judgment against the term "reactive hyperinsulinism" coined by Dr. F. T. G. Prunty (Sept. 23, p. 398) for those cases of hypoglycaemia not due to organic causes, such as islet-cell tumours. Dr. Prunty preferred the term "reactive hyperinsulinism" to that of "functional hyperinsulinism" of Conn (1940), since the word "functional" has other less well defined associations.

There is abundant evidence to show that these cases of "functional hypoglycaemia" occur in psychoneurotics, very often as the presenting feature, and for this reason they are often referred to as the nervous type of hypoglycaemia—open to the same objection given for "functional."

Since the condition is not uncommon it is important that terminology be simple as well as accurate. Dr. R. D. Lawrence, in a letter in your columns (Dec. 11, 1943, p. 760), used the term "spontaneous hypoglycaemia," and this seems preferable to those suggesting either a functional basis or hyperinsulinism.

May I suggest as an alternative "reactive hypoglycaemia."—I am, etc.,

Guy's U.S.A. Hospital. George R. W. N. Luntz.

Service Medicine

Sir,—In the correspondence on this subject officers, almost invariably of high rank, have gone to great trouble to defend the Services—risking the obvious inferences. It appears that in all these letters hospital treatment has been held up as the be-all and end-all of efficiency. Surely hospital treatment is a very small fraction of the sum total of medical treatment, and it is at the greater aspect of the medical care of personnel that criticism might well be levelled.

The opinions of individual medical officers—of whatever rank—are of little value in the matter, merely expressing a personal belief or opinion. The opinions of Service patients would be of much greater value, and I venture to suggest that they would be far from flattering. This unhappy result is not solely the fault of individual medical officers, who are without doubt handicapped by veritable avalanches of regulations, instructions, amendments, and memoranda, etc., *ad nauseam*, which results in "playing safe and passing the buck."

The opinion of your correspondent Capt. Hall bears little weight—Capt. Hall would do well to remember that the war has been in progress for considerably longer than his two years of service. The point is that it has taken *five* years of futile struggling to produce the state of mind reflected in the letters of earlier correspondents. This point is, I think, borne out by the fact that this correspondence is recent.

The point raised by your correspondent R. G. Gordon is interesting. And it will always be a source of wonder to me why men with the most efficiency, the most expensive and most lengthy training of any branch of the Service, are required to inspect latrines, which task needs no medical knowledge whatsoever and merely entails inspection for dirt, flies, etc., which should be within the scope of any administrative officer.

I do not think that there is any real inefficiency among medical officers but rather a tragic state of disinterested resignation—tragic because of its long story of slow disillusionment, of blasted ideals and hopes, and of smothered enthusiasm and initiative. Generally speaking, the system works comparatively well, but the cost in post-war clinical inability and lack of knowledge through being out of touch has still to be reckoned, and will, I feel sure, be colossal.—I am, etc.,

India. GILBERT FRASER.

SIR,—"Service Doctor" in his letter (Sept. 30, p. 451) is, in my opinion, grossly unfair to the average Royal Air Force N.C.O. and medical orderly who work in station sick quarters. His five years' service must have been unfortunate in this respect. The many R.A.F. medical officers, including myself, would have made many more clerical errors (of some importance), especially in our early months of apprenticeship, were it not for the medical N.C.O. Civilian secretaries can also be inefficient, and they have to be paid.

The pilot flying his plane up has to take it on his charge. Other officers in other branches of the Service are in the position of having vast quantities of stores on their charge, for which they are responsible. "Service Doctor" ought to be reminded that there is a fair-wear-and-tear ruling for his electric light bulbs!

Never have I seen in the R.A.F. Medical Service red tape obstructionism intervene when the life or future health of a patient was at stake. I can only conclude that accusations sometimes made on this very important aspect of red tape may be due partly to lack of initiative of the M.O. concerned. Many of us who are in the Service for the duration of present hostilities will be glad to be free again to go as we please; but while the chaos of war remains and is likely to for some time, it seems only fair to serve patiently, especially in a Service with such a fine record as the R.A.F. Many others, besides the younger members of the medical profession, did not want their individual ambitions and desires frustrated by the war.

In concluding, it seems only fair to do away with anonymity, for it proves fear of reprisals, and surely fear is one of the things we are fighting.—I am, etc.,

GLYN DAVIES,
Fl. Lieut., R.A.F.V.R.

SIR,—I admire the succinct summary which Dr. G. M. Hodges (Sept. 23, p. 417) accords my letter of Sept. 9. I wish I could admire his logic as well. He first states there are "buts," and then produces—but one, and that occurs after the man is discharged from the Service. Is there any fundamental reason why one should not get on as well with the officials of State medicine as one does with the "higher ups" in Service medicine? Aren't some of us, even at the present time, supervised? A D.M.O. is responsible to the guardians committee and/or the county M.O., a panel doctor is responsible to the local insurance committee and to the R.M.O. Wherein lies the difference?

As to my being fortunate in my superior officers, I have in five years (not four as previously stated) as C.M.P. to the R.A.F. seen and experienced a vast number of changes in the personnel, but, without exception, I have always had a fair and polite association with them.—I am, etc.,

Norwich. P. B. CORBETT.

Need for Reform in Clinical Teaching

SIR,—With regard to the problems of medical training and various projected reforms in the curriculum, I feel that you may be not unwilling to publish the views of a student on these somewhat controversial topics. The opinions I express are, I should stress, based on individual observation and experience: they are not intended to be representative of general opinion among medical students.

My own conviction is that clinical teaching, not pre-clinical, stands in most urgent need of reform. A pre-clinical student is taught along the lines accepted as being the most practical and coherent in nearly all science faculties of nearly all universities: a course of lectures, supported by laboratory classes and demonstrations, with optional or semi-optional "tutorials" for advanced students. Yet for a clinical student there are seldom, if ever, systematic courses of lectures on any of the basic subjects; teaching rounds in the wards provide a hopelessly inadequate substitute for the valuable methodological exactitude of the laboratory; and, worst of all, the student is expected to "pick up" knowledge by dint of individual push and initiative. In the latter process we may find that the lazy take discreet avoiding action, the shy or diffident are suppressed by belligerent house officers and sisters, while a few tenacious spirits collect odd fragments of "knowledge," which are about as homogeneous as "liquorice all-sorts."

The remedy for all this is, surely, the bringing into line of clinical teaching with pre-clinical. It is sometimes argued that clinical material cannot be made available in such a way that the teaching can be formal and systematic. To some extent this may be true, but not true enough, surely, to justify the present chaotic methods. The lack of readily available demonstrators in the wards is one of the most conspicuous flaws: overworked house officers cannot be expected to fulfil this function, but why should there not be young postgraduate teachers who make teaching their full-time job?

As to reform of the curriculum, what strikes one as most obvious is that a "little learning" of some highly complex subjects, notably psychiatry and dermatology, is a waste of time which could be devoted to a more searching acquaintance with casualty practice and so-called minor maladies. Not long ago I arranged for a young woman troubled by warts on her fingers to see an eminent dermatologist, who cured her without the slightest difficulty; she had been treated by an extremely competent G.P., who had, nevertheless, failed to remedy the nuisance. Would it be heresy to anticipate that, in due course, enlightened members of the general public, afflicted with psychological problems or skin troubles, will go straight to the appropriate person without the cumbrous intervention of the G.P.?

The essence of efficiency, few would surely deny, is to avoid "knowing less and less about more and more"; if the curriculum were to be much further burdened this dilemma could hardly be averted. But it would take a genius to sort out the existing confusion at a single stroke.—I am, etc.,

London, S.W.10. J. A. FLETCHER.

Lay Psychiatry

SIR,—As a reply to the letter of Mr. D. H. Kitchin on the subject of lay psychiatry (Sept. 30, p. 450) I would like to stress the point that psychiatry must be strictly amoral, and must dispel guilt-feelings so often linked to ethical issues. It would therefore seem that a clergyman would usually be the last person desirable to practise psychological medicine, which should be reserved solely for the qualified physician, who also has recourse to such methods as intravenous narco-analysis.—I am, etc.,

T. H. HARGREAVES.

Obituary

ALEXANDER BREMNER, C.B.E., *M.C.*, T.D., M.D.

Col. Bremner died suddenly at his home in Sheffield on Sept. 29 aged 54. He had led an adventurous and unselfish life in two spheres of action—as a physician and as a soldier in two wars.

He was educated at the Anderson Institute in Shetland and at Edinburgh University, where he graduated M.B., Ch.B. in 1913, and was a prominent member of the O.T.C. When war broke out in 1914 Bremner joined the Army as a sergeant-major and as unofficial M.O. to a battalion raised in Hull by Sir Auckland Geddes. He was later transferred to the R.A.M.C. and went to France. After a few months he was invalided home with typhoid fever, and later was attached as M.O. to the Dublin Fusiliers, with whom he stayed for the remainder of the war and saw service at Suvla Bay, Salonika, Egypt, and Palestine. For valour in rescuing wounded under fire he was awarded the Military Cross and later was mentioned in dispatches for gallantry in the field.

In 1919 he married Miss Ella Elphinston, herself a graduate in medicine of Edinburgh, and in the same year they went to live in Sheffield, where Bremner took over the practice of his uncle, Dr. Inkster. In 1925 he was appointed deputy medical director of the Edgar Allen Institute and in 1926 honorary physician to the Children's Hospital, Sheffield. Later he became lecturer in diseases of children at Sheffield University. He took his M.D. and the D.T.M.&H. at Edinburgh in 1919 and the D.P.H. in 1920. The after-care and rehabilitation of rheumatic children was one of his constant preoccupations, and he was instrumental in organizing the clinic for rheumatism under the Sheffield School Medical Service. His most important work was probably in connexion with children's diseases, not only as a physician but as a committeeman and as an administrator. He had a talent for getting things done.

He joined the Territorial Army as M.O. to the 71st Field Brigade, R.A., about 1925, and continued to serve with them until the early part of 1940. He was then promoted to lieut.-colonel and proceeded to France as O.C. of a field ambulance and acting A.D.M.S. Although his division was largely untrained he led his command from the south of France to Belgium when the Germans broke through in May, 1940. Here he became involved in heavy fighting, was again mentioned in dispatches for gallantry, and was severely wounded in the retreat to Dunkirk. Back in England Bremner spent some months in hospital, mending his fractured legs. He was promoted colonel, A.M.S., in charge of a general hospital, and with this unit he landed with the first British troops in North Africa. The transport containing his equipment was sunk in harbour by enemy action, but under heavy aerial bombardment he organized the salvage of enough stores to erect a hospital which was receiving casualties within a few days. He was again mentioned in dispatches for gallantry in the field and later was awarded the C.B.E. Among his other achievements in North Africa he organized the hospital medical services disinfecting station. He returned to this country in October, 1943, after his services had been asked for by his hospital and by the university. He threw himself immediately into organizing means to assist those now in the Forces when they returned to civilian life.

A correspondent writes: Bremner loved soldiering when there was something to be done; he could not find an outlet for his energies in the peacetime Army. In many ways he remained very youthful. He had a large practice in the West End of Sheffield, but probably had more non-paying patients than any other practitioner in the district. He was a first-class physician who used laboratory aids only when they were essential to the diagnosis. Apart from his skill as a physician his constant cheerfulness and his kindliness helped greatly to restore many people to health. Whatever group or society he belonged to, his was always the chief driving power behind the organization.

WILLIAM A. BREND, M.D.

We regret to announce that Dr. William Alfred Brend, barrister-at-law of the Inner Temple, died on Oct. 5 at Charing Cross Hospital, where he had been lecturer in forensic medicine for many years.

Born in Kensington on April 29, 1873, son of William Brend, M.R.C.S., he was educated at St. Paul's School, Sidney Sussex College, Cambridge, and King's College, London. He took a first in the Natural Sciences Tripos in 1895, and a year later the B.Sc.Lond. with honours, taking the M.B., with honours in forensic medicine, in 1903, and the M.D. in State Medicine (with gold medal) in 1915. He received the M.R.C.P. in 1939. During the last war he served as temporary major, R.A.M.C., and was inspector of hospitals in France and Belgium for the Croix Rouge. Brend was a member of the British Psychological Society and the British Psycho-Analytic Society, and served for some time as Neurological Deputy Commissioner of Medical Services under the Ministry of Pensions; he had also had charge of the special Medical Board for Functional Nervous Disorders. Apart from his teaching post at Charing Cross Hospital he examined in forensic medicine for the Universities of London and Edinburgh, was an active member and at one time vice-president of the Medico-Legal Society, and wrote a *Handbook of Medical Jurisprudence and Toxicology* for the use of students and practitioners, which reached a seventh edition ten years ago. He also contributed to the *Nineteenth Century*, the *Edinburgh Review*, and to medical journals, and published in 1915 an inquiry into the statistics of deaths from violence and unnatural causes in the United Kingdom, and in 1917 a book, *Health and the State*.

Dr. Brend served at the headquarters of the B.M.A. on the Ministry of Pensions Subcommittee, and on the subcommittee on Amendment of Coroners' Laws and Death Certification, and was vice-president of the Section of Public Medicine at the Annual Meeting held at Bath in 1925.

Dr. Archibald Gordon Gullan, consulting physician to the Liverpool Stanley Hospital, died on Sept. 9 at his home at Formby. He had been a member of the Liverpool City Council and was chairman of the Liverpool Division of the B.M.A. in 1928–9. He was born at Swansea on Oct. 15, 1871, and from Berkhamsted School went to study medicine at University College, Liverpool, where he won the Holt Scholarship after qualifying in 1894. Two years later he graduated M.B.Lond. and proceeded M.D. in 1899; he obtained the F.R.C.S. diploma in 1897 and the M.R.C.P. in 1901. His early appointments in Liverpool were those of medical tutor and registrar at the Royal Infirmary, assistant physician to the Infirmary for Children, and demonstrator of anatomy and of physiology in the University. He served during the last war with the rank of lieut.-col., R.A.M.C.(T), as officer commanding the 1/3 West Lancs Field Ambulance; he was later in charge of the Military Hospital at Gibraltar, and described in these columns the epidemics of cerebrospinal meningitis and of influenza on the Rock. In addition to his long service on the visiting staff of the Stanley Hospital Dr. Gullan was also consulting physician to the Waterloo Hospital and lecturer on clinical medicine in the University. He represented his Division at the Annual Meetings of the B.M.A. at Oxford, Leicester, and Exeter in the early years of this century, and held office as secretary of the Section of Medical Sociology when the Association met at Liverpool in 1912.

Norah Bore, B.A., M.R.C.S., L.R.C.P., L.R.A.M., who died on Sept. 12, had had, alas, only five years of medical practice. Before that she had had a career in the musical and educational world, where she showed the remarkable qualities of mind that won the admiration and love of many colleagues. It was as a teacher that her interest first turned to child psychology, for she felt the futility of an educational system which concentrated only on intellectual training while neglecting the child's emotional needs. She therefore took up the study and practice of psychology, only to become convinced that she could not make her full contribution to this work without a medical training. Hardly had she begun as a medical student when she was attacked by the disease which finally killed her. With full knowledge of the odds against her, she decided to go on. She qualified in 1939 and undertook a year's general practice in a Welsh mining district and a further year as medical officer in a mental hospital before she considered herself ready for her chosen work. She brought to it a sureness of touch and profundity of understanding that at once gained recognition. Her services were sought after in child guidance clinics all over the country. Her unstinting response probably hastened her end; but, as always, it was a deliberate choice. She preferred not to hoard her life. In these last three years she achieved what seemed to those who knew her a miraculous ascendency over pain and weakness. While she was working she was so effortless and easy that an outsider would not have known that she was ill. Her work in this time was more than can be measured in quantity or duration. Although death cut it short, her grateful patients and her, at least, equally grateful colleagues feel that its value will live on.

P. H.

The tragic death, on Sept. 24, of Brevet-Col. John Oscar Thomas, *M.C.*, T.D.—drowned whilst bathing—is a great loss to his many friends and colleagues in and around Rochester, where he had been in practice since 1923. Born in 1891, Thomas was the younger son of the late Mr. and Mrs. Walter Thomas of St. Blazey, Cornwall, and received his medical education at the Westminster Hospital, London, where he was a scholar and prizeman. Qualifying in 1914, he served throughout the last war, during which he was awarded the Military Cross, subsequently returning to the Westminster Hospital, where he held all the resident house appointments, became the first resident medical officer, and took his M.D. and M.R.C.P.Lond. Thomas settled in Rochester in 1923. Early in 1927 he was appointed honorary assistant physician to St. Bartholomew's Hospital, Rochester, and has been an active member of the medical committee for many years. In 1933 he established the department of electrocardiology. Later he was appointed honorary physician with charge of in-patients, and recently became full honorary physician. Despite the heavy calls of an extensive consulting practice Thomas kept up his close association with the Territorials, holding for some years command of the County of London 140th Field Ambulance, and on the outbreak of the present war he was called up from the Reserve of Officers and left his practice to organize a general hospital of 1,200 beds, with which he went to France in October, 1939. In the withdrawal of the B.E.F. he was one of the last to leave St. Nazaire. In September, 1940, he mobilized another medical unit, which he took to the Middle East, serving there for three years, first in command of No. 5 Convalescent Depot in Sinai Peninsula, and later commanding No. 16 General Hospital (A.M.S.). Always a keen horseman and a strong swimmer Thomas's busy life gave him little leisure for these relaxations. He leaves a widow and one daughter, and in their grievous loss may they find some consolation from the high personal regard in which he was universally held and the large number of those who gathered at the memorial service in Rochester Cathedral to pay their tribute.

Medical Notes in Parliament

E.M.S. Hospitals

Hospitals in the Emergency Hospital Scheme are administered by their normal governing authorities and not by the Ministry of Health. The scheme now includes 1,640 hospitals, of which 671 are controlled by local authorities. Medical officers attached to a local authority hospital are under the discipline of the hospital authority, which is generally exercised through the medical superintendent. The scheme as originally planned provided for the treatment of civilian casualties from enemy action and of persons transferred from one hospital to another to afford accommodation for the treatment of such casualties. The treatment of these cases is provided for under sections 50 and 53 of the Civil Defence Act, 1939. The scheme has since been extended under agency arrangements made with the Government Departments concerned and authorized by the Treasury, to include Service casualties and sick, members of the Merchant Navy, and various groups of civilian patients engaged on work of importance to the war effort in this country. This information was given by Mr. Willink on Oct. 11 in answer to an inquiry by Sir Ernest Graham-Little.

Production of Penicillin

Replying on Oct. 11 to Mr. A. Edwards, Sir Andrew Duncan said the volume of penicillin production both in this country and in North America had substantially increased during the past three months. Total supplies amply covered Service needs. Increased quantities would become available for civilian use. A large-scale plant now being erected in this country would be managed by the Distillers Company for the Ministry of Supply and would begin production in the spring of next year. Inquiries about civilian supplies should be addressed to the Ministry of Health. Dr. Haden Guest reported that Mr. Willink had made penicillin available when required in a large number of cases, and that a circular to that effect had been issued to all medical men in the country.

Psychiatrists for Duty in Prisons

Mr. Herbert Morrison announced on Oct. 12 that the Prison Commissioners have appointed two consulting psychiatrists to act as part-time medical officers at Wormwood Scrubs and Holloway Prisons. Medical officers at all prisons have been instructed on the types of cases in which psychological treatment may be beneficial. These cases are transferred to Wormwood Scrubs or Holloway for assessment and treatment. The psychiatrist at Wormwood Scrubs, who was appointed in February, 1943, examined in that year 60 male prisoners, of whom 18 received full courses of treatment. The psychiatrist at Holloway, who began work in April, 1944, has investigated 25 cases, of whom 7 are receiving active treatment.

University Representation

The House of Commons went into committee on Oct. 12 on the Redistribution of Seats Bill. Mr. Pritt moved to omit the clause relating to university constituences. He contended that if persons who had university education were specially represented in the House, there should also be special representation for scientists and doctors. Prof. Savory recalled that his predecessors in the representation of Belfast University had been Col. Sinclair, a most distinguished surgeon, and Sir William Whitla, whose *Dictionary of Treatment* formed part of the library of every doctor. Sir Ernest Graham-Little said there was a strong view that political qualifications should not be considered in a member of a university. He followed that rule himself. He pointed out that Prof. A. V. Hill was a link between the Royal Society and the House. Mr. Peake pointed out that the Speaker's Conference on Redistribution had agreed that the representation of the universities should continue. Mr. Pritt's amendment was defeated by 152 to 16. The Bill passed through Committee and was read a third time.

Treatment of Silicosis.—On Oct. 10 Mrs. Tate asked the Minister of Fuel and Power whether he had any information about the discoveries that had been made at McGill University, Montreal, concerning the prevention and cure of silicosis. Major Lloyd George said he was aware of the experiments going on in Canada on the treatment of silicosis by the inhalation of aluminium powder, which were probably what Mrs. Tate had in mind. These experiments were being closely watched both by his Department and by the Medical Research Council, but he was advised that the results were not yet conclusive enough to justify the adoption of this method of treatment at British mines. Mrs. Tate asked if the Minister would get into touch with McGill University to see whether these were the same experiments. Major Lloyd George said he would certainly do so, but he believed that our people had been in touch. A report was recently published in South Wales dealing with the question of silicosis, and as a result of that he was satisfied that every possible research was being made.

Notes in Brief

A substantial additional tonnage of paper has now been allocated for educational books.

A free grant of £477,500 has been made under the Colonial Development and Welfare Act for the construction of a new hospital of 1,100 beds at Mulago, Uganda. The Governor proposes to increase the present accommodation to 700 beds in temporary buildings while the new hospital is under construction.

The Services

The King of Egypt has conferred the Insignia of the Third Class of the Order of the Nile on Lieut.-Col. A. G. Harsant, O.B.E., R.A.M.C., on the occasion of his retirement from the professorship of anatomy in the Faculty of Medicine at Fouad University.

Capt. (Temp. Major) D. G. C. Whyte, R.A.M.C., has been awarded the D.S.O., and Capt. R. R. Lal, I.A.M.C., the M.C., in recognition of gallant and distinguished services in Burma.

CASUALTIES IN THE MEDICAL SERVICES

Killed in action.—Capt. Matthew Donald Murrough Bergin, R.A.M.C.

Died.—Capt. William Dinwoodie Speedy, War Subs. Capt. Ian Malcolm Hill, R.A.M.C.

Previously reported missing, now reported to have died while a prisoner of war.—Capt. Percival Binnington, R.A.M.C.

Missing, presumed lost at sea, while prisoner of war in Japanese hands.—Major John Moore Officer, R.A.M.C.

Reported missing.—Capt. T. F. Redman, R.A.M.C.

Reported missing, believed prisoner of war at Arnhem.—Col. G. M. Warrack, A.D.M.S., 1st Airborne Division.

Missing at Arnhem.—Capts. J. G. Jones and B. Brownscombe, R.A.M.C.

Missing at Arnhem, believed prisoner of war.—Capt. G. B. D. Scott, R.A.M.C.

Missing from operations in N.-W. Europe.—Capt. C. A. Simmons, R.A.M.C.

Missing in Italy.—Capt. E. Haigh, R.A.M.C.

Wounded.—Major R. L. Harward, War Subs. Capts. D. M. Swayne, I. S. Dalton, M. MacIntyre, I. F. Thompson, Lieuts. W. I. Cooper and J. H. Orr, R.A.M.C.

Repatriated.—Surg. Lieut. A. P. B. Waind, R.N.V.R.

No. 39

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Sept. 30.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1944 (a)	(b)	(c)	(d)	(e)	1943 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	39	4	18	2	2	30	1	17	3	1
Deaths		—	—				—	1		
Diphtheria	545	14	159	90	29	724	26	192	60	* 28
Deaths	6	1	2	2	—	10	1	1	—	—
Dysentery	351	28	145	—	—	337	91	62	—	—
Deaths				1	—				—	—
Encephalitis lethargica, acute	2	1	—	—	—	3	—	—	—	—
Deaths		—					—			
Erysipelas			40	7	5			63	6	1
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				69					74	
Deaths	63	1	24	14	6	69	10	20	26	12
Measles*	2,015	27	201	46	42	465	32	42	14	1
Deaths	—	—	—	—	—	—	—	—	—	—
Ophthalmia neonatorum	67	2	11	—	—	80	3	19	—	—
Deaths										
Paratyphoid fever	11	—	—	—	—	7	—	—	1	—
Deaths	1	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal†	479	14	8	2	2	409	16	18	1	2
Deaths (from influenza)	9	1	2	1	—	12	1	1	—	1
Pneumonia, primary			216	20				155	8	
Deaths		15		7	5		18		8	8
Polio-encephalitis, acute	2	—				3	—			
Deaths		—					—			
Poliomyelitis, acute	20	1	6	4	1	13	2	9	—	—
Deaths		1								
Puerperal fever		2	15	—	—		4	17	—	—
Deaths		—					—			
Puerperal pyrexia‡	143	4	17	—	2	143	12	20	1	1
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,838	39	372	41	63	2,956	282	381	45	88
Deaths	—	—	—	—	—	—	—	—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	11	1	5	6	1	7	1	3	4	5
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	982	55	55	21	12	1,583	106	140	32	13
Deaths	8	3	2	2	—	10	1	1	—	—
Deaths (0–1 year)	316	26	55	36	13	316	38	64	39	34
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	3,895	467	537	209	84	3,915	571	551	167	135
Annual death rate (per 1,000 persons living)			12·3	13·6	§			12·4	11·0	§
Live births	6,332	430	923	395	286	6,387	757	866	451	264
Annual rate per 1,000 persons living			18·8	25·6	§			17·7	29·6	§
Stillbirths	182	14	32			205	24	36		
Rate per 1,000 total births (including stillborn)			24					40		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

‡ Includes puerperal fever for England and Wales and Eire.

§ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* notifications of scarlet fever and measles continue to mount; this week they are 142 and 506 respectively higher than last, the incidence having almost doubled since the end of August. Notifications of whooping-cough fell by 77, and the total is now about one-third of the level last June. Lancashire reported 47 more cases of scarlet fever than last week, but 41 fewer cases of whooping-cough. Glamorganshire's total for the latter went down by 31. There were 21 fewer notifications of diphtheria than last week, and the only local variation of any size was a rise of 19 in Lancashire. Measles was particularly prevalent in the north, especially in Durham, Lancashire, and Yorks West Riding, where notifications went up by 192, 86, and 61 respectively.

There were 14 fewer cases of dysentery than last week. The chief centres of infection were Glamorganshire 57, Essex 42, Derbyshire 31, London 28, Lancashire 27, Carnarvonshire 23, Hertfordshire 21, Surrey 19, Suffolk 16, Kent 13.

In *Scotland* the incidence of scarlet fever went up by 50, of measles by 45, and of dysentery by 11. In Edinburgh the notifications of dysentery dropped to 31, while in Glasgow they rose to 71.

In *Eire* 39 more cases of measles, 8 more of scarlet fever, and 4 more of diphtheria were reported than last week. The incidence of diarrhoea and enteritis remained unchanged; 44 of the 69 cases were recorded in Dublin C.B.

In *Northern Ireland* there were 23 more cases of measles and 9 more of scarlet fever than last week, but 7 fewer of diphtheria.

Cerebrospinal Fever

The falling trend of the incidence of cerebrospinal fever has been checked during the last two quarters. The incidence of this disease steadily diminished after the violent outbreak in the beginning of 1940, and the successive peaks and endemic levels fell until 1943. Although the number of cases in the first quarter of this year were only three-quarters of the number in 1943, the returns for the second and third quarters showed little improvement on the totals for the corresponding quarters of last year. The number of notifications for recent years are:

	Average of 1936–9	1940	1941	1942	1943	1944
1st quarter	427	5,093	4,332	2,412	1,287	978
2nd ,,	333	4,100	3,435	1,859	916	873
3rd ,,	224	1,793	1,780	929	542	526

The trend for 1944 is similar to that of the pre-war years, but at over twice the level. The rates for each quarter are 2.3, 2.6, and 2.3.

Quarterly Returns for England and Wales

The birth rate for the second quarter was 19.3, and was the highest rate for a June quarter since 1925. The average birth rate for the second quarters in the five years before 1943 was 15.7. Infant mortality was 43 per 1,000 live births, 11 below the average of the ten preceding June quarters, and was the lowest rate ever recorded for a second quarter. Stillbirths formed 2.7% of the total births. The general death rate was 11.2 per 1,000, being 0.3 greater than the rate for the June quarter of 1943, but 0.8 below the average rate for the second quarters of the five years 1938–42. The natural increase—excess births over deaths—was 83,801, compared with 7,228, 50,674, and 67,802 for the second quarters of 1941–3.

Week Ending October 7

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,932, whooping-cough 860, diphtheria 509, measles 2,492, acute pneumonia 628, cerebrospinal fever 24, dysentery 390, paratyphoid 7, typhoid 7, poliomyelitis 19.

According to the U.S. Office of War Information, orthopaedic surgeons at Camp Wolters, Texas, have developed a new technique for treating "march fracture" when this occurs in the second and third metatarsal bones. A thin flat iron is built into the non-weight-bearing portion of the sole of the shoe, a felt or rubber pad sometimes being included as well. They call this device a "march bar," and claim that it produces rapid healing by protecting the bone from strain. The man is not sent to bed but kept on duty.

Medical News

At the annual general meeting of the Medical Society of London, to be held on Monday, Oct. 23, at 4.30 p.m. the presidential address on "Subjective Disorders of Sensation" will be given by the incoming President, Dr. Anthony Feiling.

Mr. R. A. Butler, Minister of Education, will address the School Medical Service Group of the Society of Medical Officers of Health at the Town Hall, High Holborn, London, W.C.1, on Friday, Nov. 3, at 2.30 p.m. He will speak on "The Place of the School Medical Service in the Education Service of the Future." The annual general meeting of the group will be held immediately after Mr. Butler's address.

The National Conference on Maternity and Child Welfare, which was postponed in July last owing to the restriction on travel, will be held on Thursday and Friday, Nov. 23 and 24, in the Big Hall of Friends House, Euston Road, N.W., with Sir George Elliston in the chair. The subject for discussion is "The Rebuilding of Family Life after the War." Mr. Henry Willink, Minister of Health, will give his presidential address on the second day at 10.30 a.m. Tickets, 3s. each for one day, 5s. each for two days, may be obtained from Miss M. R. Lovelock, secretary of the National Association of Maternity and Child Welfare Centres and for the Prevention of Infant Mortality, 117, Piccadilly, London, W.1.

A demonstration of some of their recent work will be given at the Inoculation Department of St. Mary's Hospital, W.C., by Sir Almroth Wright and Sir Alexander Fleming on Tuesday, Oct. 24, at 8 p.m. Owing to technical considerations the attendance will be limited to members of the Polish Medical Association in the United Kingdom and to members of the Paddington Division of the B.M.A.

The annual general meeting of the Middlesex County Medical Society will be held at Chase Farm Hospital, The Ridgeway, Enfield, on Thursday, Oct. 26, at 3 p.m., when an address will be given by Dr. C. Allan Birch on "Medical Emergencies." Visitors, including members of the American and Canadian Forces at present in this country, will be welcome.

At the next meeting of the Medico-Legal Society, to be held at Manson House, 26, Portland Place, W.1, on Thursday, Oct. 26, at 5 p.m., Dr. Eric Gardner will read a paper on "Death in the Bathroom." Members may introduce guests to the meeting; tea at 4.30.

The Personal Service League has consulted the British Hospitals Association in regard to the distribution of a substantial gift of dried banana. The League has accepted the suggestion that some of the dried banana should be held in reserve against its requirement for use in cases of coeliac disease or other emergency. Application may be made for supply to the Personal Service League, 41, Lowndes Square, London, S.W.1 (telephone, Sloane 6291) by day or night.

The twentieth annual report of the Nursery School Association of Great Britain for the year 1943 is a 16-page pamphlet, obtainable from the new headquarters at 1, Park Crescent, London, W.1.

Dr. James Deeny, F.R.C.P.I., has been appointed Chief Medical Adviser to the Department of Local Government and Public Health, Government of Eire.

Universities and Colleges

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a quarterly meeting of the Council held on Oct. 12, with Sir Alfred Webb-Johnson, President, in the chair, Dr. Rupert A. Willis, pathologist at the Alfred Hospital, Melbourne, Australia, was appointed as the first Sir William H. Collins Professor of Human and Comparative Pathology. Prof. Matthew Stewart was elected Moynihan Lecturer for 1945. Mr. P. H. Lovell was nominated as the fifty-second Jenks Scholar. Votes of thanks were given to Sir Buckston Browne for an augmentation of the endowment for the annual dinner of Fellows and Members of the College; to Mrs. Cecil Joll for a silver-gilt loving cup, once the property of William Cheselden; to Miss B. C. Crookshank for a fire-screen panel embroidered with the arms of the College; and to Mrs. King for pictures and busts of Sir William Blizzard.

Diplomas of membership were granted to R. Astley, F. Batley, M. F. Bethell, P. H. Friedlander, Alison B. Hay-Bolton, Adrian Hill, J. G. Kendall, R. J. P. Pugh, Irvine B. Smith, A. McR. Walker.

Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, London, W.C.1. Telephone: EUSTON 2111. Telegrams: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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B.M.A. Scottish Office: 7, Drumsheugh Gardens, Edinburgh.

ANY QUESTIONS?

Sulphonamides and Sterility

Q.—*I have heard it stated that the sulphonamide group of drugs induce sterility. Is there any truth in this? If so, how long would the sterility so induced last?*

A.—There are animal experiments which suggest that the sulphonamide group of drugs may reduce spermatogenesis, but the bad effect is only temporary and not likely to last more than a few months. It is difficult to give clinical evidence of this because the infections for which sulphonamides are given are themselves likely to reduce fertility.

Cockroaches and Infection

Q.—*How far are cockroaches known to serve as carriers of human infection?*

A.—Several experiments have shown that cockroaches can transfer germs mechanically on their legs, and it has also been reported that the following bacteria can be passed through the alimentary canal of a cockroach, quite unharmed: *B. tuberculosus, B. leprae,* cysts of *Entamoeba histolytica,* and *E. coli.* Transmission of human infection is liable to occur under the following conditions: (1) if the cockroaches have access to human food; (2) if they have access to sources of infection. Condition 1 must be very commonly fulfilled, as cockroaches are mainly troublesome in kitchens. The sources of infection (2) vary from one situation to another; there may be particular danger where there are cases of illness present, as in a hospital. A habit of cockroaches which makes them likely to pick up germs is their frequent searching for water, which leads them to visit sinks, drains, slops, etc.

The Psychology of "the Presser"

Q.—*What is the mental process involved in the phenomenon known as "pressing" in the game of golf? Carried to its logical conclusion the emotions obtain complete sway over reason. The same psychological process is seen under different disguises in everyday life. What is the remedy?*

A.—"Pressing" in golf is the physical result of the longing to do superlatively well. The cure is not "Don't press," but, "Be content to go by easy stages from tee to pin." The better-class players and professionals do not "press" because they have a stable confidence in their own ability, born of aiming at the possible and not the impossible. The "presser's" muscles are taut and poorly co-ordinated because he aims at an ideal and is apprehensively aware that this is pitched too high. The "pressers" in everyday life are aiming *too* high and refusing to face their limitations. Reason may control the emotions if the source of the anxiety to succeed can be faced and checked—e.g., where an adolescent deems it necessary to live up to a parent's ambitions. Emotions outrun reason where the source of the ambition presides in a modified "Lady Macbeth complex," to succeed in order to stamp out shame or guilt. The "pressers" in everyday life strain not so much the muscles of their upper extremities as their autonomic system, which reacts by irregular peristalsis and is registered as nervous dyspepsia or nervous colitis. The remedy is simple persuasion in the first group, more intensive psychotherapy in the second (if this is not contraindicated), and small doses of luminal to help them through special periods of stress.

Erb's Paralysis

Q.—*What is the treatment of Erb's paralysis in an infant—the result of a very difficult confinement?*

A.—Erb's paralysis is usually caused by traction of the upper part of the brachial plexus, leading to tearing of the nerve fibres and subsequent paralysis of the muscles which surround the shoulder—particularly the deltoid and the spinati, and the forearm muscles—particularly biceps, brachialis anticus, and the supinator longus

Treatment depends upon how long the paralysis has been present and upon whether it is thought that neurosurgical treatment is likely to be of benefit. It is a very difficult problem to decide whether it is going to be worth while to expose the nerves in the hope of approximating the ends in order to encourage regrowth of nerve fibres. The results are not sufficiently good to make one advise this procedure whole-heartedly. Some say that it is best when the paralysis is severe to explore as soon as possible in the hope of effecting a reasonable union; others recommend waiting for about six months to see whether any recovery is taking place. The physician should be guided in this by the severity of the paralysis. In any case the affected arm should be put up in a light splint producing abduction of the shoulder and flexion of the elbow—the so-called aeroplane splint. The condition of the muscles should be maintained by light massage and by adequate galvanism, which has been found to be effective in preserving muscle bulk. Later on, if paralysis persists, orthopaedic treatment can do much to improve the usefulness of the arm, particularly by transplanting muscles and by limiting the mobility of the shoulder-joint. Unfortunately many cases will require some such intervention.

Saline Infusion into Tibia

Q.—*Could you advise me on the technique of saline infusion into the marrow of the tibia?*

A.—Technique of saline infusion into the marrow of the tibia is similar to that of blood transfusion. An ordinary administering or taking needle as used in the apparatus for taking or giving blood supplied to the E.M.S. can be employed if ground to a proper length. If preferred the Salaj sternal puncture needle is quite satisfactory. Splint the leg with a straight splint applied to the outer aspect of the leg and keep in position by ties from the foot to mid-tibia and from the lower to the upper thigh. The site of puncture is the antero-medial surface of the tibia at the level of the tibial tubercle, which can be easily felt even in the youngest infant. The skin is cleansed with soap and water and iodine or alcohol, and a local anaesthetic injected into the skin subcutaneous tissues and periosteum. The puncture needle is then inserted at right angles to the plane of the antero-medial surface of the tibia as nearly as possible halfway between the anterior and medial borders of the tibia. The needle should be inserted distally—i.e., away from the epiphyseal line—but a needle absolutely vertical in all planes should miss the epiphyseal line. The soft bone of an infant is punctured easily and gives the feeling of stale cheese; no marked give is noted when the marrow cavity is entered. Entry is usually attained about 1/8th to 3/16th of an inch below the periosteum and can be proved by the aspiration of marrow. The procedure is then the same as for sternal puncture. The infusion tends to be slow at first and to increase in rate spontaneously after 5 to 10 minutes. The infusion, therefore, in infants usually has to be slowed from time to time rather than quickened as in the adult. Reference may be made to the papers by Tocantins, O'Neill, and Jones, *J. Amer. med. Ass.*, 1941, **117**, 1229; Hamilton Bailey, *British Medical Journal*, 1944, **1**, 181; and Janet Gimson, ibid., 1944, **1**, 748.

Dehydration

Q.—*What is the pathology and treatment of the clinical entity known as dehydration?*

A.—A most readable account of dehydration with full references to the literature is given in the chapter on thirst in Macdonald Critchley's book *Shipwreck Survivors*, London, 1943. Many of the symptoms of disease which were formerly ascribed to toxaemia are now regarded as the effects of dehydration. About 70% of the body weight consists of water. If more than 10% of this water is lost—i.e., 6% of the total body weight—the patient shows signs of serious dehydration—scanty urine, dry skin and tongue, and sunken eyes. Dehydration may occur from a diminished intake of fluid, as in the shipwrecked sailor or the stuporose patient; or from increased loss, as from a high internal or external temperature, vomiting, diarrhoea, or polyuria. Dehydration is an important factor in states of acidosis and alkalosis.

Two good rules for avoiding dehydration are never to pass a febrile patient without offering him a drink and never to purge a really sick man. Treatment is the restoration of the fluid balance by large volumes of fluid by mouth or parenterally. The normal output of fluid is about 2,500 c.cm. a day—1,500 c.cm. of urine and 1,000 c.cm. water of evaporation from the skin and the lungs. In disease the output may be greatly increased, and a daily fluid balance chart should be kept of all patients who are threatened with dehydration. By the time a patient shows dehydration he has a debit of some 5 litres of water, so he will require at least 8 litres of fluid in the first 24 hours to restore him to normal. The kidney is not very efficient in dehydration, and care must therefore be taken not to wash an excess of salt out of the body or, on the other hand, to put in an excess of salt. About 5 g. a day is the optimum. Wherever possible fluid should be given by mouth, glucose orangeade made with one-fifth normal saline being suitable. If this is not possible the rectum is the next best route, and the fluid should be one volume of normal saline to four volumes of tap water. Intravenously a mixture of one volume of normal saline with four volumes of 5% dextrose in distilled water may be used, but it is wise to examine the bases of the lungs and the blood chemistry at frequent intervals if large volumes of fluid are given parenterally. The body cannot pick and choose when fluid is given parenterally, and it is fatally easy to give an excess of fluid by this route.

Congenital Absence of Abdominal Muscles

Q.—*At birth a child was found (forceps delivery) to have a large abdominal cyst which apparently was evacuated in utero, for the amniotic fluid contained hair and was therefore presumably a dermoid cyst. The ribs at birth were much everted, and the abdominal wall lay in thick folds, suggesting that the cyst was large and accounted for the delay in birth. The baby unexpectedly responded to stimulants and is now 5 weeks old. The abdominal wall is still much thickened and corrugated, but the baby is fit and developing normally. A cyst could be felt in the lower abdomen three weeks ago, and it was thought the tumour was filling up, but this has disappeared although the stool has apparently been normal and there is no discharge from the vagina or rectum. The urine is normal. Can any suggestions be made of the origin of the tumour, the prognosis, and the treatment?*

A.—I think the case described is one of congenital absence of the abdominal muscles. An excellent illustration of this curious condition is to be found in the 3rd edition of *Diseases of Children*, by Garrod, Batten, Thursfield, and Paterson, on page 847. The syndrome consists of complete absence of abdominal muscles, thickening and wrinkling of the skin on the abdomen, which makes it look like elephant hide, and gross dilatation of the pelves of the kidneys, the ureters, and the bladder. The connexion between these three factors is far from obvious. It is hard to imagine that simple stretching of the skin can produce the extraordinary thickening or that the absence of the pressure of the abdominal muscles should cause the urinary drainage system to dilate. It has been suggested that gross distension of the abdomen by the expanded bladder may have prevented the development of the abdominal muscles; but this again seems unlikely. I do not think that there is much doubt that the "cyst" felt in the abdomen was a dilated bladder. I have never before heard of hairs being found in the amniotic fluid in this condition, but if they had come from inside a dermoid cyst there would almost certainly have been a large amount of sebaceous matter as well.

As to treatment I have had a case which appeared to be distinctly benefited by a specially made elastic corset which supplied the pressure which should have been exerted by the abdominal muscles. Prognosis is, of course, poor. The dilated urinary system is liable to infection and the absence of abdominal respiration gives a bad outlook in bronchitis or pneumonia. Most cases die in the first year or two from one or other of these causes.

Enlarged Hilar Gland

Q.—*A person gives a history of contact with a case of pulmonary tuberculosis. On examination the lungs are clear. Sedimentation rate and sputum are both normal. On x-ray investigation the radiologist gives the following report: "Enlarged hilar shadows," or "Hilar shadows more evident than normal." The lung field is otherwise normal. What importance am I to attach to such reports?*

A.—If the patient is a child, the most probable cause of hilar gland enlargement, in the circumstances, is a primary tuberculous infection. If, however, the tuberculin skin test is negative, other causes of hilar gland enlargement such as pertussis or more rarely leukaemia or lymphosarcoma would have to be excluded. In the case of a primary tuberculous infection the absence of clinical signs of activity would indicate that no treatment is necessary. The child should be removed from contact with the infection and kept under close observation with frequent *x*-ray examinations. If the patient is an adult the same remarks apply except that primary tuberculosis becomes less likely and lymphadenoma would have to be excluded. Very slight enlargement of the hilar shadows is often of no significance.

Afferent Nerve Impulses and Shock

Q.—*Given that "pain" is a large factor in the production of shock, both immediate and delayed, in the case of burns, is it possible that afferent impulses resulting from stimulation of temperature nerve-endings in the skin and passing up "heat tracts" in the cord are an added or associated factor? Not only might this apply in the case of heat—i.e., the immediate shock of the actual burn or scald—but also in the case of cold resulting from the inevitable baring and exposure of the burnt surface—delayed shock.*

A.—The part played by afferent nervous impulses in the production of shock is far from clear. The most painful injuries—e.g., hands mangled in machinery—may be associated with no fall in blood pressure. Atkins (*Brit. J. Surg.*, 1937, **24**, 717) has shown that the blocking of pain sensation by procaine in the brachial plexus is associated with a fall rather than a rise in blood pressure.

It is thus quite likely that painful sensations exert a pressor rather than a depressor influence on the circulation. The *general* cardiovascular reaction to heating the body (vasodilatation) has been shown by the schools of Carmichael and Lewis to result from the action of warmed blood on the vasomotor centres. Nervous impulses passing up the thermal pathways in the cord have little if any influence in producing this effect. It seems unlikely, therefore, that thermal nerve impulses as such play any part in producing shock or in modifying the clinical picture.

Reverting to the first clause of the question, pain is well recognized as a factor precipitating a fainting reaction. Barcroft and his colleagues have now shown that fainting results from a nervous mechanism which induces vasodilatation in voluntary muscles (*Lancet*, 1944, **1**, 489). This so-called vaso-vagal type of shock is easily recognized by its association with bradycardia and other features. It might well be expected to occur in burn shock, but specific data on this point are lacking.

INCOME TAX

New Practice: Cash Basis

L. G. took over a practice on a death vacancy as from March 26, 1943. His predecessor (and he himself in a former practice) had previously been assessed on the basis of cash receipts. The inspector of taxes refuses to accept this basis for the first three years of the new practice.

*** The inspector's action is legally correct and is in accordance with the usual custom. It is undeniable that the cash receipts of a first year do not give a true reflection of the earnings or profits of that year, and the tax is chargeable on profits, not merely on profits which have come to hand in cash. So L. G. will have to add to the amount of his cash receipts for the year to March 26, 1944, the value of the debts outstanding at that date, say £x less £7 (the estimated amount to be lost by non-payment). At the end of his second year he will deduct that amount from his cash receipts for that year and add the value of the debts outstanding at March 26, 1945, and so on. On that basis there need be no fear that the receipts will pay tax twice.

Board and Lodging

R. B. S. assisted a doctor as a locumtenent for a fortnight and arranged that the usual expenses of himself and his wife should be paid during their stay in lieu of salary. The income tax authorities are claiming tax on the amount of these expenses, less an allowance for railway fares to and from the place of employment.

*** Assuming that the board and lodging were the responsibility of the principal—e.g., that R. B. S. did not incur the liability for payment to the landlady and the principal meet the liability for him—then we do not understand the action of the authorities. It is settled law that the receipt of benefits in kind which are not capable of being turned into money by sale, etc., does not create liability to tax. If, however, A owes his landlady £25 and B by arrangement pays it for him, that is equivalent to a payment of £25 by B to A.

LETTERS, NOTES, ETC.

Tetanus Immunization for Farm Workers

Dr. J. A. Eddy (Norwich) writes: I feel that the reply in "Any Questions?" (Sept. 16, p. 391) errs seriously on the side of complacency. You state that "among agricultural workers the risk is small," and give instances of two severe types of wound for which antitoxin would be required. I have had two cases of tetanus in this district as a result of apparently quite trivial wounds. One was a cut less than 1/2 in. long in the finger made while sharpening a hedging tool. I am pleased to add that I was not responsible for the original dressing of this wound. The other case was in a man who had been lifting sugar beet with his hands. There were several very superficial scratches, one of which had become infected, but so slightly that the patient did not seek any advice until he was actually suffering from clinical tetanus. Both cases recovered in hospital. The only safe answer to this question is that unless the farm worker is protected by means of tetanus toxoid a dose of antitoxin must be given after every wound, however trivial. The hands of these men are always likely to be contaminated with soil.

Telegony

Dr. K. B. Pinson (Manchester) writes: In the *Journal* of Aug. 26 (p. 296) the answer which you give to a question regarding telegony is, I think, quite wrong about Darwin. The impression I gathered from reading *The Origin of Species* was certainly not that he had any belief in it. In fact I do not think he mentions it anywhere. I have carefully read again all that he said in *The Origin* concerning Lord Morton's mare. The whole argument, which passes from the markings and blue colour apt to appear when distinct breeds of pigeons are crossed to the zebra-like striping on the legs and shoulders and even the face, as well as on the hindquarters and spine of some breeds of horses, and particularly in the offspring of crossed species of the horse genus, is to support the contention that there is a tendency to revert for some reason in such cases to an ancestral type, which, in the pigeon, is known and in the horse presumed. The markings are associated with colour—blue in the pigeon and dun in the horse. Lord Morton's mare was crossed with a quagga (a species now rare or perhaps extinct), and the hybrid was much more striped on the legs than a pure quagga. So also, however, was the offspring of a subsequent mating of the mare with a black Arabian stallion. Darwin accounts for this not by telegony but by the above observed tendency to stripes, especially when a dun colour appears. This is not the first time I have come across an important misrepresentation or misapprehension, as I think, of Darwin's thesis. For one thing the book needs attentive reading, and when he sets out to answer a question it is not by a short cut-and-dried answer but by illustrations and inferences not always easy to follow.

Byssinosis

Dr. H. S. Russell (Shipley) writes: Your reply (May 27, p. 737) concerning byssinosis suggested that it occurred in woollen mills and was connected with "mill fever." May I point out that only cotton mills are affected by the Byssinosis Order, and that mill fever is considered to be due to a mould contaminating the cotton, while byssinosis is due to the cotton fibre itself. Incidentally, the condition of chronic bronchitis and emphysema almost universally found in woolcombers is not legally an industrial disease. Why any discrimination should be made between cotton and wool operatives is very difficult to understand.

The Metric System

Dr. Ian Campbell (Mexborough, Yorks) writes: The correspondence on the advantages of the metric system in prescribing prompts me to write that in the last six months three wholesale medical firms have been unable to supply a 10-c.cm. conical measure!

Pyretotherapy for Gonorrhoea

Dr. A. H. Bartley (London, S.W.16) writes: A colleague asks for a description of the T.A.B. vaccine shock treatment for gonorrhoea (*Journal*, Oct. 7, p. 457). May I be permitted to describe my method which I wrote about in the *Lancet* in September, 1935. On admission the patient is put to bed on a milk diet and given an intravenous injection of 0.25 c.cm. T.A.B. vaccine (Army brew) in 5 c.cm. sterile normal saline solution. In about an hour he develops a typical malarial attack, the temperature rising to 103°–105° F. The next day the patient as a rule is quite normal, but some complaint of a slight headache may be made. The injections are repeated every third day, the dose of T.A.B. vaccine being increased by 0.25 c.cm. each time. By the third injection the patient is "dry." Three injections usually suffice. I gave four in one case only. In conjunction with this treatment local irrigations of a weak solution of potassium permanganate, 1 in 10,000, is given night and morning in between the injection days, and an alkaline mixture is given internally thrice daily. I used this method for fresh and chronic infections and got excellent results in both, especially with the crippling type of arthritis that sometimes complicates gonorrhoea. Gonococci disappear from the smears after the second injection, and no after-effects whatever were noted. I emptied a ward of 20 cases in a month. Some of these cases had been trailing on for six months or more. I had no relapses.

Concurrent Herpes Zoster and Varicella

Dr. Emily Simon (London, W.5) writes: It may be of interest to record the following case, which is strikingly similar to Dr. Manning's case (July 22, p. 115). A man aged 63, previously in good health, complained in the evening of March 21, 1943, of stiffness of the left side of the neck. The following morning there was a crop of vesicles over the back of the left shoulder and the left side of the neck. The vesicles enlarged and crusted and were typical of herpes zoster. On March 23 a few pink macules and papules appeared on the trunk, and by March 26 the patient had a well-developed varicella rash involving trunk and limbs. The zoster lesions were still present but subsiding. There was no previous history of chicken-pox or of herpes zoster, and no history of contact with either disease. I am indebted to Dr. Warden, the family physician, for asking me to see this case. I have also seen a case of well-marked varicella in a middle-aged woman preceded by herpes zoster of the right frontal region. Both rashes were present at the same time, but the herpetic eruption was a day or so in advance of the chicken-pox.

Correction

In Lieut.-Col. R. W. Fairbrother's article "The Control of Bacillary Dysentery," there was an error in the last line but one of the first column on p. 490, Oct. 14. Group (*a*)—as the first paragraph in the next column makes plain—should read "routine without sulphonamides."